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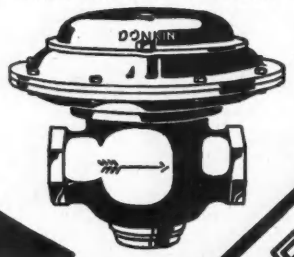

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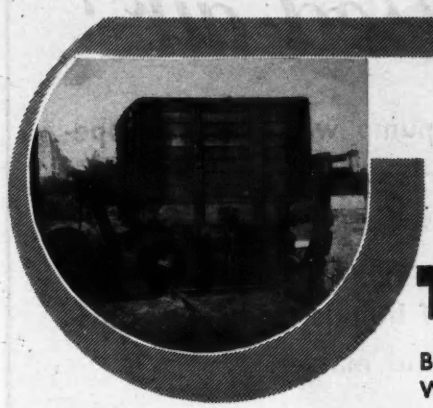

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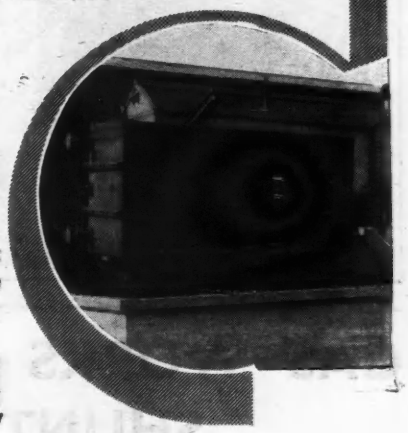

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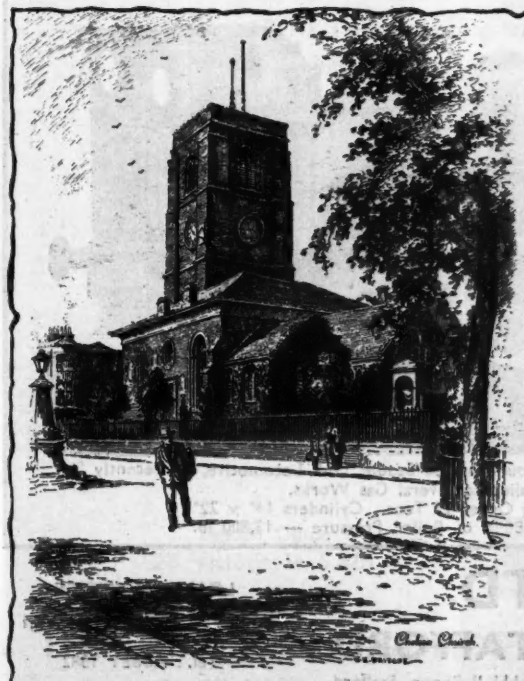

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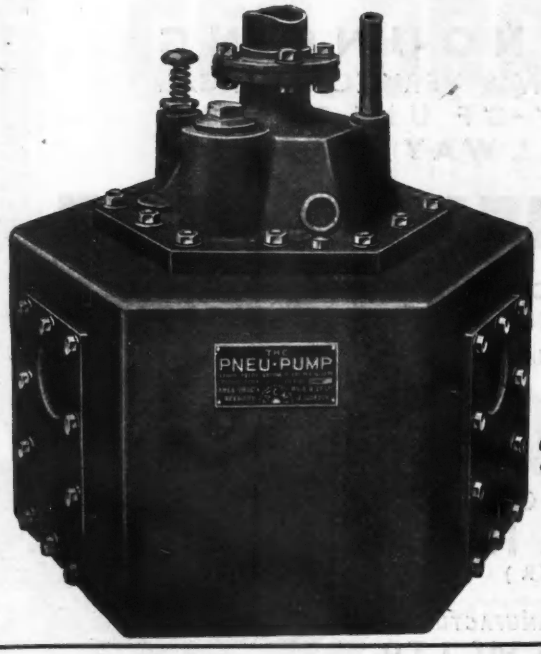

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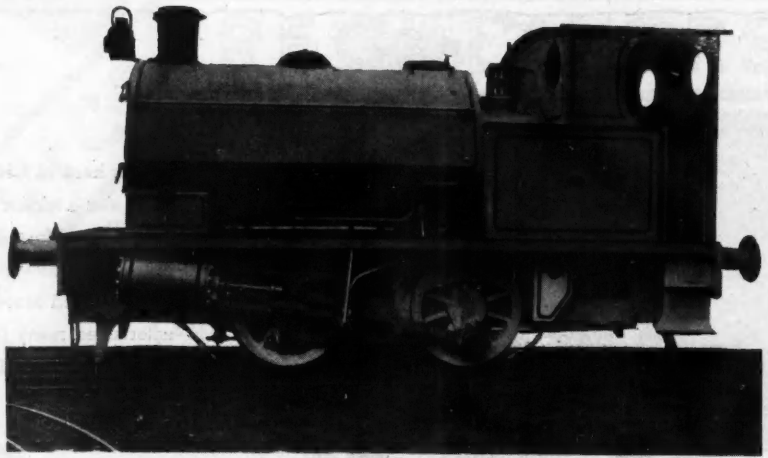

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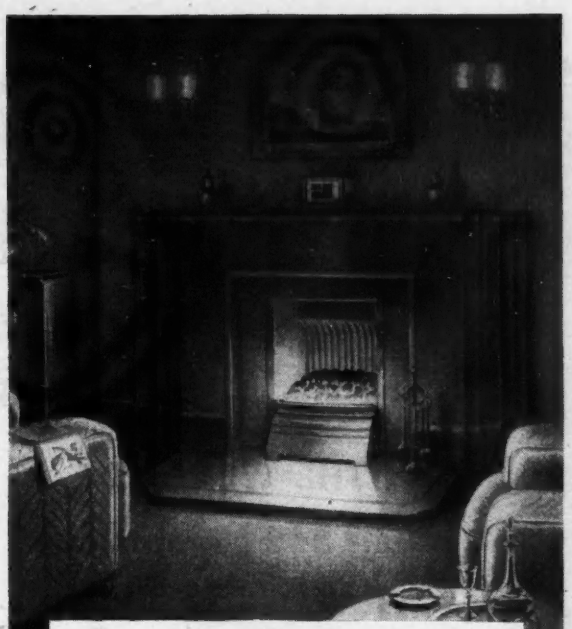

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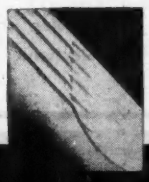

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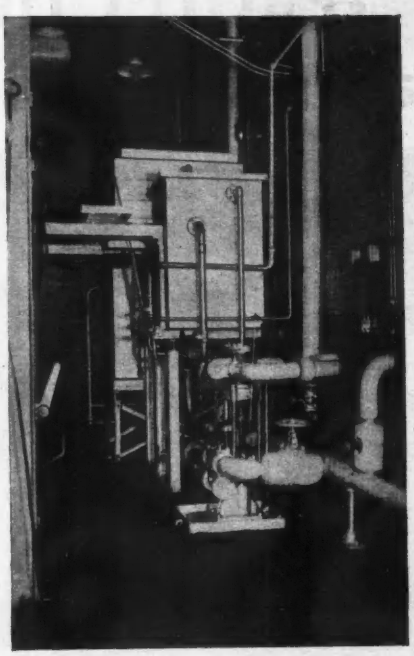

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CONTENTS

EDITORIAL NOTES

The Industrial Load 45
Forthcoming Fuel Conference . . 46

Personal 46
Obituary 46

Letter to the Editor 47
De La Rue Gas Development, Ltd. . 47
Diary 47
Home Guard Stand-Down Party . 48
Thermal Efficiency of Plastics Moulding Press 49
The Balloon Barrage 50

Retort House Operation and Control. By C. A. Deas 53
Women's Gas Council . . . 61
Liverpool's New Benzole Plant . . 61

Gas Products Prices 62
Gas Stocks and Shares . . . 62

THIS WEEK'S ADVERTISERS

	PAGE
Alder & Mackay, Ltd.	S2
Ames Crosta Mills & Co., Ltd. ...	34
Bagnall, W. G., Ltd.	34
Bale & Church, Ltd.	64
Blakeley, Firth, Sons & Co., Ltd. ...	64
Boydell, E., & Co., Ltd.	38
Bray, George, & Co., Ltd. Cover II	
British Thomson-Houston Co., Ltd.	S3
Carter-Erectors, Ltd.	40
Concrete Proofing Co., Ltd. ...	39
Cowan, W. & B. ... ... Cover III	
Crane, Ltd....	S6
Curtis, A. L.	S6
Dempster, Robert, & Sons, Ltd. ...	64
Donkin Co., Ltd. (The Bryan) Cover II	
Eagle Range & Grate Co., Ltd...	39
Edgar, Wm., & Son, Ltd. ...	41
Electric Construction Co., Ltd. ...	S6
Ewart Chainbelt Co., Ltd. ...	63
Falk, Stadelmann & Co., Ltd. ...	S7
Filtrators, Ltd.	40
Gas Meter Co., Ltd.	S4
Gas Purification & Chemical Co., Ltd. ... ... Cover I,	64
Gas Robots (Great Britain), Ltd....	S6
Glover, George, & Co., Ltd. ...	33
Glover, Thos., & Co., Ltd. ...	44
Grant, David, & Co.	S4
Green & Boulding, Ltd.	64
Griffiths Bros. & Co. (London), Ltd.	S7
Harrisons (London), Ltd.... ...	64
Holden & Brooke, Ltd.	S6
Holmes, W. C., & Co., Ltd. ...	S1
Horseley Bridge & Thomas Piggott, Ltd.	S3
Humphreys & Glasgow, Ltd. ...	42
Keith Blackman, Ltd.	S8
King's Patent Agency, Ltd. ...	63
Main, R. & A., Ltd.	58
Mewburn, Ellis & Co.	63
Murex Welding Processes, Ltd. Cover IV	
Newton Chambers & Co., Ltd. ...	52
Parkinson, W., & Co.	44
Pulsometer Engineering Co., Ltd. Cover IV	
Pyrene Co., Ltd.	36
Quasi-Arc Co., Ltd.	63
Radiation, Ltd. 56,	57
Rawlplug Co., Ltd.	43
Reavell & Co., Ltd.	63
Sawer & Purves, Ltd.	35
Slingsby, Walter, & Co., Ltd. ...	S2
Stanton Ironworks, Ltd.	64
Staveley Coal & Iron Co., Ltd. ...	63
Stein, John G., & Co., Ltd. ...	S8
Strachan & Henshaw, Ltd. ...	33
Technological Institute of Great Britain	64
Thomas & Bishop, Ltd.	62
Trotter, Haines & Corbett, Ltd.	64
Walker, C. & W., Ltd.	35
West's Gas Improvement Co., Ltd.	60
West's Piling & Construction Co., Ltd. ... ... Cover IV	
Whessoe Foundry & Engineering Co., Ltd.	35
Willmott, A. R., & Co.	S2
Winn & Coales, Ltd.	37
Wood, Hugh, & Co., Ltd. ...	S5
Woodall-Duckham Co.	51
Trade Cards	62
Appointments Vacant	64
Books Wanted	64
Company Notice	64
Contracts Open	64
Educational	64
Patents	63
Plant, &c.	64
Plant, &c., For Sale and Wanted...	64
Repair Work	63

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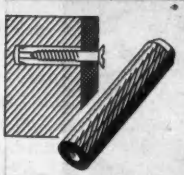

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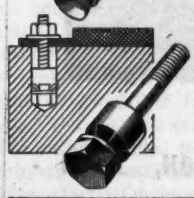

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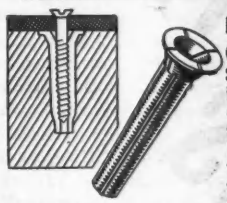

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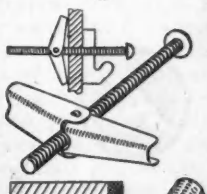

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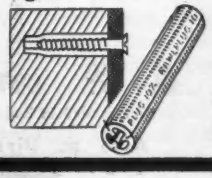

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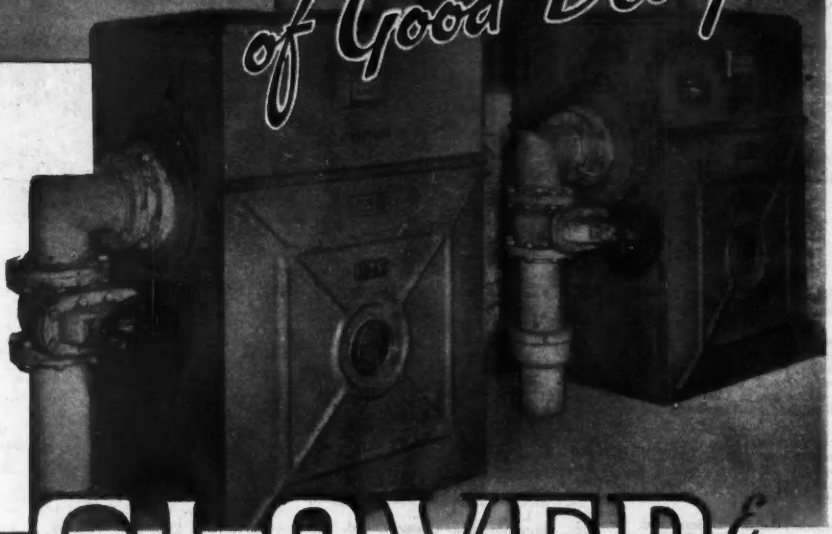

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GAS JOURNAL, JAN. 10, 1945

VOL. 245 97th YEAR No. 4260

EDITORIAL NOTES

THE INDUSTRIAL LOAD

SINCE 1939 the demand for gas by industries engaged on war production has been very great and ever-increasing. The Gas Industry has risen to the occasion in regard not only to the actual production of the required quantities of readily controlled and flexible heat, but also to the development of new technique in application to fulfil new and extraordinary demands. It will have gained much experience and added knowledge; and at this stage it seems to us appropriate to consider briefly how the Industry stands in relation to the industrial load, and more particularly its attitude towards the load in the transition period, whenever that arrives, from war to peace. How, in brief, it can use this added knowledge to the best advantage of all concerned.

First of all, we may well ask, What is the industrial load? To our mind its interpretation lacks anything like precise and agreed definition, and we think the time over-ripe for getting down to agreement in this matter. We are grievously wanting in unity and in statistical information vital to the development of the various industrial gas loads. In assessing what percentage of their total gas sales is represented by industrial gas consumption, undertakings have their own ideas; some include this load (it may be central heating of other than domestic premises), other exclude that load (it may be large-scale cooking). This only results in confusion, which in the best interests should be eliminated—and with co-operative will it could be eliminated. The Gas Industry, *qua* Industry, ought to be able to tell, with a fair degree of accuracy, responsible Government departments, for example, the quantities of gas used in the various industries and in the numerous sections of those industries. The picture would be illuminating, and would throw light on the directions in which concentration of effort in developing loads would be most fruitful, the while bringing into relief weak spots. The gathering together of information of this kind on an agreed basis appears to us a practical step of first importance, on which foundation a great deal could be built. It is a question simply of determination and co-operation—determination to do away with the present haphazard procedure, which precludes the answering of the simplest of questions concerning the industrial gas load. Whatever the merits of individualism, we must cease to be satisfied with present incoherence. This seems to us a question which the Industrial Centres Committee might well tackle.

That the Industrial Gas Centres have done invaluable work is beyond doubt. Their inception was one of the wisest moves made by the Industry, and we have often referred to progress directly traceable to the Centres. But what—and this in our second point—are the Industrial Centres? To what extent can their work be extended. How ought we to set about such expansion. The story of their inception and establishment is well enough known. They are the outcome of an enlightened attitude and vision on the part of the managements of certain gas undertakings, who saw that the development of the industrial load called for the provision of special facilities and the employment of specialists in the field—managements prepared to launch out on new ventures in the faith that expenditure on facilities and skilled technical staff would be rewarded. Their faith has been justified. They are the outcome, too, of collaborative effort. Obviously the small undertaking cannot afford appropriate technical staff for industrial development, but as a member of a Centre it can enjoy and profit by the results of the Centre's work. And the smaller undertakings joining in the scheme have reaped benefit. We have not, however, gone far enough. With the expansion of the industrial load during the war years there has—understandably enough—not been commensurate extension of the Centres' equipment and staffing. When peace returns it will, if we are intent on retaining and developing the industrial load, channelling wartime activities into peacetime production, be necessary to make up a great deal of leeway in the provision of adequate accommodation and equipment for research and demonstration, and of the number of trained technical staff. The demand for flexible heat easily controlled will exist—and, we would add, gas is not the only source of refined heat readily controlled.

So to our third point: The future calls for imagination in the present. Under wartime conditions, amid many—we will not say exasperations—difficulties, the Gas Industry has satisfied demands well and speedily. Speed has, indeed, been paramount; speed still is paramount. Economy and thermal efficiency have taken second place. Economy and thermal efficiency will not take second place, we suggest, when the war is over. They will become factors of no little importance in a period of renewed competition among the fuel interests. Another factor of importance will be appearance, the eye-appeal of industrial equipment. Every domestic gas salesman knew pre-war the value of a good-looking domestic appliance from the sales angle. We hold the view that after the war the industrialist will regard the appearance of his equipment as being an important factor. He may not buy on appearance only, but his choice will be influenced by it. During the war years, over five years now, has the Gas Industry progressed or retrogressed in thought concerning the appearance of industrial gas equipment? This is no idle question. Of course materials have been scarce, of course we have had to make do and mend, of course we have had to improvise and to "knock together" odds and ends into composite gas units which have both proved both efficacious and wholly acceptable in the trying circumstances with speed uppermost. But we must look ahead; and in looking ahead, with our intelligence corps reporting constantly on what is being done by other fuel interests, we may well ask ourselves whether even under current conditions we are giving sufficient attention to cleanliness of design and general attractiveness of industrial gas equipment. Cleanliness of design demands technical skill. Overall attraction and pleasing appearance of an industrial gas unit—a piece of apparatus which looks "alert"—demands skill of no mean order. We must provide for this aspect, and in the meantime even a coat of paint would do no harm to many industrial appliances we have seen lately.

To what, then, do we look on the return of peace? At any rate we can see for ourselves now how entirely inadequate are the current facilities and accommodation of the Industrial Centres as a whole. Cramped and confined, they have done excellent work, as we have said. Return to peace will emphasize the current inadequacy, and will call again for that imaginative outlook on the part of managements of gas undertakings which alone made possible the birth of the Industrial Gas Centres, which, though comparative youngsters, are sturdy on a strictly rationed diet. Return to peace will call for more expenditure for better results and bigger reward.

Which brings us to our fourth point. Just as there must be sympathy and understanding between the managements of gas undertakings and their industrial staffs, and between groups of gas undertakings and the composite technical staffs serving these

groups, so there must be sympathy and understanding between the technical staffs and the industrialists with whom they deal in their daily contacts. That the industrial gas technician should have knowledge of thermodynamics is all very well and all very necessary. He should also know how to translate theory into practical effect, how to explain to the practical industrialist what this theory means to him in his own processes. This aspect, insufficiently covered in the past, demands tact and patience, the climbing-down from any theoretical high-horse, and most certainly a knowledge of human nature and sympathy with the other fellow's point of view. It also calls for demonstration facilities to enable the industrial gas technician to show his probable or possible customer what gas can do for him to solve his especial problems—demonstration facilities adequate in relation to the potentialities of the industrial load. Generally speaking, such facilities as exist are inadequate and unbusiness-like—that is, looking to likely future needs.

Not that our intent is to belittle what the Gas Industry has accomplished through its Industrial Centres Scheme. Far from it. The Centres have, as we have emphasized, done excellent work. But, when the war is over, their potentialities should, through more support, be further crystallized, and we look not only for greater co-operation between the various Centres, but for more effective individual work by each individual Centre, each striving in common aim, each exercising ingenuity and originality, every one of them going forward with new ideas, better design and finish of appliances, better linking-up with the industrialists in their areas of supply. We may be forgiven if, before calling a halt to these few thoughts, we refer specifically to the London Industrial Centre, which, after all, was pioneer in the Centres movement. It was enlightened management which led to the establishment of Watson House by the Gas Light and Coke Company and the housing there of the Company's industrial section, where neither accommodation nor skilled staff was lacking, where every encouragement was given. We think we are right in saying that the Industry generally has benefited from this move. Inevitably there have been teething troubles, but there have also been highly constructive results. Among the industrialists in an area which has steadily grown and is not confined to the Gas Light there has been built up an effective spirit of co-operation; many new industrial techniques have been studied and many new appliances designed; as a visit last week to the London Centre showed, more than ever is emphasis being laid on performance plus appearance rather than just thermal efficiency alone and "hang the rest." And just as the other Industrial Centres may have something to learn from the London Centre, so can they add original work and new idea to the common fund of knowledge; and this calls, post-war, for better facilities and more trained personnel.

FORTHCOMING FUEL CONFERENCE

IN these columns recently, discussing the activities of the Institute of Fuel, we said that one of the attractive features is that it provides a remarkable and unique platform for discussion of fuel problems in a more general way than would otherwise be practicable, enabling the constituent fuel interests to get together and gain a composite picture making clear the views and needs of sectional interests in the fuel field in relation to the fuel problem as a whole. We welcome, therefore, the fact that a conference has been arranged to take place in Manchester next month to elicit from users what they consider to be the essentials of a satisfactory coal supply—to discuss the qualities of coal required by these various sections, together with the problems involved in the preparation of these qualities by the coal industry. The date fixed is Feb. 28, and the meeting will be opened by a *résumé* of the problem by Dr. E. S. Grumell, Chairman of the Fuel Efficiency Committee of the Ministry of Fuel and Power. There will follow statements on the needs of the gas and electricity industries, of the iron and steel industry, and of general industry, which we take to mean the use of coal for steam raising. Questions to be considered will include those of caking properties, size, ash content, and clinkering characteristics desired by these sections of industry, and views will be advanced on modifications which may be regarded as practical, and the effect of these modifications on the efficiency of the processes involved. That will be part one of the conference, and the Gas Industry should certainly put forward, among other suggestions, its ideas about ash content. Part two of the conference will be in the nature of a reply from leading authorities in the coal industry, and we understand that matters to be dealt with include the extraction of dust and wet and dry washing. The object of the day's discussion is to shed light on the costs involved in producing the fuels the consumer demands, and to give the producer clearer notions of what is required by the consumer, the hope being that through a better understanding between producer and consumer a higher overall efficiency, thermal and economic, may eventually be secured. Both the aim and idea of the conference and the broad platform for informed discussion which it presents appeal to us very much. The subject matter is obviously of first concern to the Gas Industry, as it should also be to the supplier of the Industry's raw material; and its importance from the national point of view needs no stressing.

Personal

New Year Honours

In the New Year Honours List appears the name of Mr. ALLAN CAMPBELL MACDIARMID, Chairman and Managing Director, Stewarts and Lloyds, Ltd. who has been created a Knight Bachelor.

Mr. THOMAS SYDNEY NETTLEFOLD, Chairman of Woodall-Duckham (Australasia) Pty., Ltd., who has just entered upon his third year of office as Lord Mayor of Melbourne, also is created Knight Bachelor.

Mr. GEORGE DIXON, Engineer and Manager of the Nottingham Gas Department, has been awarded the O.B.E., as also have Mr. D. V. HOLLINGWORTH, Coke Oven Manager, Blaenavon Company, Ltd., and Mr. F. HOYLAND, Newton Chambers & Co., Ltd.

Mr. JAMES H. WILSON, Chairman and Managing Director of George Wilson Gas Meters, Ltd., receives the M.B.E. in recognition of his services as Commandant of the Coventry City Special Constabulary. He has been a member of the force for 30 years, and was awarded a national commendation for his work during the air raids in April, 1941.

Mr. R. R. HOGBIN, Distribution Superintendent, Dover Gas Company, has been awarded the B.E.M.

* * *

Mr. J. F. LORD, who has been appointed Manager and Secretary of the Kettering Gas Company on the retirement of Mr. T. E. Maddocks, took up his new duties last week.

* * *

We learn that Mr. H. C. MANN, M.I.Mech.E., M.Inst.Gas E., has resigned his Directorship of the Chemical Engineering and Wilton's Patent Furnace Co., Ltd., and now has no connexion whatsoever with the Company.

Obituary

The death occurred on Dec. 16 last of Mr. MONTAGUE JOHN DURANT, who was a Director of the Bideford Gas and Coke Company, Ltd., from 1920 to the date of his death, and who held the office of Chairman from 1927 to 1938.

* * *

The death occurred on Jan. 3 of Mr. ANTHONY S. NESBIT, who was Manager of the Paisley Gas Department from 1918 until 1939, when he retired and went to reside at Ardrossan. A grandson of the Rev. William Nesbit, of Abbey Close Church, Paisley, Mr. Nisbet was educated at the John Neilson Institute and the Royal Technical College, Glasgow, and joined the staff of the Paisley Gas Department in 1893. He spent all his working life there, rising step by step until he became Manager in 1918. In 1932–33 he was President of the North British Association of Gas Managers, and from 1935 to 1938 he served on the Council of The Institution of Gas Engineers. He was also for some time Chairman of the Scottish Tar Board.

* * *

Mr. JOHN E. HOLT, Engineer and Manager of the Ilkeston Gas Department, died suddenly on Jan. 4. He was appointed to the position in 1913, going to Ilkeston from Stalybridge, and was on duty at the gas-works up to a few hours before he died. He was a sergeant in the Special Constabulary, and leaves a widow and two sons.

Letter to the Editor

National Fuel Policy

DEAR SIR,—It is very refreshing to read such common-sense statements as were made by Dr. E. S. Grumell at the Fuel Luncheon Club on Dec. 21 last, and it must be obvious to any thinking man that there is a fundamental truth in his observation that there will never be a satisfactory answer to the questions relating to the utilization of our national fuel resources until the country faces up to a revision of the price structure and the selling of coal on relative values, as recommended by Lord Melchett's 1926 National Fuel and Power Committee.

Dr. Grumell's statement that the non-standardization of the nation's most important raw material might really be considered as a huge joke is surely understating the case, and I would respectfully suggest to him, through your columns, that the word "might" should be replaced by the word "must." The fact that successful research in the utilization of low-grade fuels by the consumer has, in time, always been turned to the financial advantage of the producer removes a great part of the incentive for industrialists using fuel to carry on with such research, and try to turn a low quality fuel into an efficient and useful power material.

For some years now there has been a deal of talk about a national fuel policy, and one would think that in a period of war, when a shortage in supplies of fuel becomes so material to the national welfare, every effort would be made to see that all fuels available were used wisely and efficiently. Yet what do we get? A condition which seems to accept that as long as material is black and has been won from the earth, it is classed as coal, and no further consideration need be given to it save efficiency of utilization. For example—recently coal has been directed to gas-works for carbonization purposes with as high as 25% of ash and 2.85% of sulphur, and, at the same time, coal from another colliery in the same district, ideally suitable for gas-making purposes, has been directed for consumption in Lancashire boilers and heating plants. The result of such short-sighted direction has meant a drop in efficiency at the gas-works receiving such coal, the production of a very poor quality coke, with resultant inefficient utilization by the consumers, and very little advantage to the steam and heat-raising plants which have received deliveries of ideal gas-making coal. Surely it would be sensible to presume that those users of coal who were processing it and producing not only two prepared fuels from it, but also by-products which are particularly valuable in wartime, should in the national interests receive, if available, the coal best suited to their process?

Again, the dispatch to gas undertakings of coals unsuitable for carbonization results in an enormous increase in the production of breeze, a low-grade material which presents certain difficulties in utilization as a fuel, and yet excess and unnecessary production of this low-grade material would be avoided if such coal were burned under boilers suitably controlled. Yet again, with the shortage of manpower that is so apparent and serious in the Gas Industry, it should surely be considered a crime against the war effort to direct to gas undertakings coals with very high sulphur contents, which necessitate the use of a considerable amount of labour to treat the gas, to comply with statutory obligations.

A further point. At the moment the country is being requested to reduce the consumption of electricity between the hours of 8 a.m. and 12 noon, due to the high demand for current in this period of the day; and from a remark the writer heard passed by an official of the Ministry of Fuel and Power, it is expected that although there may be a temporary drop in the demand for electricity immediately upon the cessation of hostilities, it will be for a period of months only, and the demand will be quickly back to the present wartime requirement. This being so, one would think that if there were any national direction in fuel utilization, there would be an attempt to direct electrical consumption from this peak demand period, and yet the opposite is the case. We are hearing of temporary houses being arranged for with all-electric equipment, particularly in the kitchens, in areas where the morning demand is already testing electrical production to the limit, and in areas where increased consumption during the morning period cannot be anything but an embarrassment to the suppliers, unless they are prepared to go in for extensive capital expenditure, and this, when undertaken, just to meet a 2–3-hour daily load. The Gas Industry is, in major part, ideally placed, because of its facility of storage, to meet this type of load without much additional capital expenditure on production plant, and yet, apparently, no recognition of this fact is entertained in the decision as to whether these houses shall have gas or electrical equipment in the kitchens.

Once again, it is fairly obvious that the beneficial effects of a national fuel policy are going to be missed, and the preferences of unknowledgeable people allowed to decide items of national welfare in the utilization of fuel.

Why will not the country face up to the recommendations of Lord Melchett's 1926 National Fuel and Power Committee, and why do the powers-that-be shirk the formulation and enforcement of a national fuel policy, having as its objective the national economic welfare?

Mirfield Gas Company, Gas-Works, Ravensthorpe.
Jan. 5, 1945.

Yours faithfully,
NORMAN HUDSON,
Managing Director and Secretary.

De La Rue Gas Development, Ltd.

Following the acquisition, reported in the "JOURNAL" for Aug. 9 last, by De La Rue Plastics, Ltd., of a controlling interest in Thomas Potterton (Heating Engineers), Ltd., further interesting developments have now taken place within the De La Rue group of companies. The Potterton organization will be considerably extended to give the additional service to the Gas Industry which post-war reconstruction will demand, and the Potterton Board, working within the De La Rue group, now consists of T. F. C. Potterton, Chairman and Managing Director, A. B. Potterton, H. P. Bridge (a Director of Thomas De La Rue & Co., Ltd.), and Leopold Friedman.

For the purpose of the design and manufacture of specialized domestic gas appliances outside the field covered by Potterton's, a new subsidiary has been registered under the title of De La Rue Gas Development, Ltd., of which B. C. Westall (Chairman and Managing Director of Thomas De La Rue & Co., Ltd.) is Chairman, the other Directors being Cyril G. R. Ashton and H. P. Bridge (both Directors of Thomas De La Rue & Co., Ltd.), and Leopold Friedman, who is also appointed Managing Director of the new Company.

Opportunity was taken at a works dinner of Thomas Potterton, Ltd., last week to explain the reasons for these changes in organization. Mr. Fred Potterton was in the chair, supported by Mr. Albert, and speeches in happy vein were made by Messrs. Westall, Ashton, and Friedman. The happy family spirit of Potterton's, based upon a tradition founded as far back as 1850, was very clearly in evidence, and Mr. Westall spoke equally convincingly of the De La Rue tradition, which dates back to 1819, and of the welcome which was extended to the new members of the group. His firm had always considered that its duty lay towards (1) its staff and workpeople; (2) its customers; and (3) and last, its shareholders. It was quite remarkable, however, if this order was strictly adhered to, how well class (3) did out of it. He could assure them that the same policy would continue to be adhered to, and that the aim, in brief, would be to find out exactly what appliances the Gas Industry needed and to supply them in the very best—or in other words, in the Potterton—quality. Mr. Leopold Friedman, whose brother Harry was also present, said that he, too, had a family tradition which, even if it was not of great antiquity in the Gas Industry, could be claimed to have been well and truly established by his eminent father. He paid tribute to the technical skill of Mr. Ernest G. Brooks, General Manager of Potterton's, and to the very firm basis of co-operation which had seemed to come naturally to the two of them in so short a time. A very happy evening, paternally presided over by Mr. Fred Potterton to the great delight of all, concluded with an entertainment by top-of-the-bill artistes of radio and stage.

Diary

Jan. 11.—Midland Junior Gas Association: Chamber of Commerce Building, Birmingham, 4.15 p.m. Paper by J. A. Tomes, Stourbridge, on "Use of Town Gas in the Processing of Glass Tableware."

Jan. 13.—Scottish Junior Gas Association (Western District): Royal Technical College, Glasgow, 3 p.m. Paper by W. B. Wright on "Industrial Instruments."

Jan. 15.—London and Counties' Coke Association: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 1.30 p.m., Gas Industry House.

Jan. 16.—B.G.F. Domestic Heat Services Committee: Gas Industry House, 10.30 a.m.

Jan. 18.—Industrial Gas Centres Committee: Gas Industry House, 10 a.m.

Jan. 18.—Fuel Luncheon Club: Connaught Rooms, W.C. 2, 12.40 for 1.10 p.m. Address by Harold Hobson, Chairman of the Central Electricity Board, on "Electricity Supply in War and Peace."

Jan. 18.—I.G.E. Meters Committee: Gas Industry House, 2 p.m.

Feb. 1.—I.G.E. Board of Examiners: Gas Industry House, 11.30 a.m.

Feb. 7.—Southern Association of Gas Engineers and Managers (Eastern District): Gas Industry House, 2.30 p.m. Paper by T. Brown (General Manager, South Suburban Gas Company), "Housing Developments and the Gas Industry."

Feb. 23.—Institute of Fuel: Joint Conference with National Smoke Abatement Society.

Feb. 24.—Manchester and District Junior Gas Association: Address by Dr. J. G. King, Director of the Gas Research Board.

Feb. 28.—Institute of Fuel (North-West Section): Conference on Preparation of Coal. Manchester.

Mar. 21.—Southern Association of Gas Engineers and Managers (Eastern District): Gas Industry House, 2.30 p.m. Paper by J. E. Davis (South Metropolitan).

A Model Kitchen designed by Mr. F. L. Scaith, the Gas Engineer, and Mr. P. F. Burridge, Borough Architect, of Stockton-on-Tees, is being exhibited in the Gas Showrooms and is creating widespread public interest. In connexion with the display the Stockton-on-Tees Gas Department is ensuring the co-operation of the local Press, architects and builders, women's organizations, and municipal authorities in the area.

Home Guard Stand-Down Party

To mark the occasion of their Standing Down the Gas Light and Coke Company's Home Guard Battalion (40 Lon) held a Social Gathering on Dec. 9, 1944, in the Drill Hall at Duke of York's Headquarters. The attendance, numbering approximately 450, was representative of each of the Battalions—17 widely spread units, together with many Senior Officers of the Company.

The Commanding Officer, Lt.-Col. F. M. Potter, O.B.E., T.D., D.L., welcomed the guests. In tendering regrets from the General Officer Commanding, London District, and the Commander, South-West London Sub-District, for not being able to attend owing to Military duty, the Commanding Officer read the following message from the Governor, Col. Sir David Milne-Watson, T.D., D.L.:

Colonel Potter presents Silver Cup to P. S. I. Trower.

"It is a great disappointment to me not to be able to be present in person at your Stand Down this evening. Unfortunately I have been unwell and my doctor will not allow me to travel to London at present. I would very much like to have expressed my appreciation of all you have done for your country in the testing times we have been through. You have spent a great deal of your time and energy and, though you were not actually called upon to fight the enemy, your readiness is all important. I hope it may not be long before you can enjoy your leisure time under peaceful conditions."

Major-General Dalby, C.B., D.S.O., M.C., paid tribute to the high efficiency of those units of the Battalion of which he had personal knowledge. The Home Guard had served a purpose, the value of which was not yet fully appreciated, and they had rendered yeoman service in co-operation with the Civil Defence, Fire Service, and Police. He hoped that one and all would feel that they had done their job well.

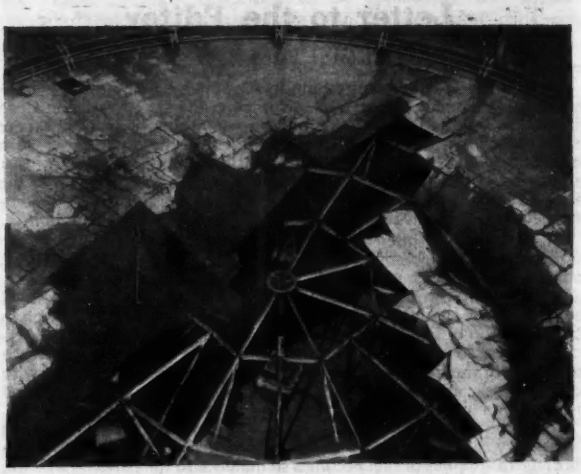
Mr. F. M. Birks, the Company's Chief Engineer, who was the Battalion's Organizer at the formation of the L.D.V., expressed Mr. Sylvester's regret that indisposition had prevented his attendance. The men of the Company, said Mr. Birks, readily responded to the appeal in May, 1940, to the extent of over 4,000. About 500 of their Home Guard had been called up for Regular Service. He conveyed the Company's thanks and gratitude to all ranks, and hoped that the many friendships which had been made would live on, even if the Stand Down had brought their military duties to a close.

Colonel Garforth expressed his pride in the efficiency and zeal of the six Engineering Units of the Battalion.

In acknowledging these tributes to the Battalion, Colonel F. M. Potter thanked his Officers, N.C.Os., and men for their loyal support. Owing to the widespread area covered by the Battalion much responsibility had rested upon Company Commanders, to whom great credit was due. He also thanked the Territorial Army and Air Force Association. The Company had given every encouragement and support right from the start. Messrs. Press and Summers had also rendered valuable assistance. A very useful fund, Colonel Potter went on, had been established, resulting in more than 1,000 parcels being sent to prisoners of war. A healthy balance stood to the fund's credit, and this would be used to give immediate assistance in cases of hardship when the time came.

One of the happiest moments during a very happy evening was a presentation by Colonel Potter of a Silver Cup to P.S.I. Trower, Royal Sussex Regiment, in recognition of his splendid services to the Battalion.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.



The Aftermath of an Enemy Air Raid. Our photograph is of a large gasholder of the Dover Gas Company, whose experiences under bombardment were described in the "JOURNAL" of Dec. 20 last.

Our photograph is of a cross-section of the employees of the Folkestone Gas and Coke Company, representing each department, who worked through the trying time the Undertaking had during four and a half years of bombing and shelling.

Standing, L. to R.—P. W. T. Edwards, syphon attendant; H. R. Ellender, mainlayer; S. W. Tunbridge, service layer; E. C. Rumbold, mainlayer; E. V. Barnard, mainlayer; C. Atkins, coke gantry man; H. Greenland, engine room attendant.
Seated, L. to R.—C. W. Goodbourn, works foreman; W. J. Kinlochan, District Superintendent; Miss V. M. Collins, senior shorthand typist; C. D. Wall, Assistant Engineer; R. G. Henderson, Mains Superintendent.

A Conference to discuss the use of science in the post-war world, to be held at Caxton Hall, London, S.W. 1, on Feb. 17–18, is being organized by the Association of Scientific Workers.

The Fuel Efficiency Directorate of the Ministry of Fuel and Power is now issuing Bulletin No. 37, which deals with small vertical boilers, steam cranes, and shunting engines. Although the fuel consumption of a single vertical boiler may be comparatively small, the type is in such wide use that the aggregate fuel consumption is considerable. Even so, a single unit can show a substantial saving. For example, a vertical boiler generating 600 lb. of steam an hour over a 48-hour week, and operating at 40% efficiency, uses about 150 tons of coal a year, not counting the extra fuel used for daily lighting up. It is quite reasonable to suppose that this figure can be brought down to about 120 tons, with a financial saving of at least £60 a year, by adopting certain common-sense suggestions, which are set out in the booklet. The suggestions are of a practical nature, and in the main can be carried out without difficulty.

An equally useful set of suggestions is offered for improving economy in the operation of steam cranes. A third section deals with works shunting engines. Mainly the suggestions outlined for saving fuel in these engines are in two directions: (*a*) the organization of shunting operations so as to reduce engine hours to a minimum, and (*b*) the maintenance and, where possible, improvement of efficiency of the engines. Of particular interest is a description of a special slide valve which gives in full gear a 50% cut-off, instead of a 75% cut-off, which is generally the case during shunting operations.

Thermal Efficiency of Plastics Moulding Press

In a Paper given recently to the Institute of the Plastics Industry, Dr. A. C. Dunningham, Chairman of the Fuel Efficiency Committee of the British Plastics Federation, discussed the heat distribution and thermal efficiency of the plastics moulding press. The Author explained that the Fuel Efficiency Committee of the Federation was set up as part of the organization of the Fuel Economy Campaign initiated by the Ministry of Fuel and Power. While its immediate objective was to save fuel to help make good the national shortage arising from war conditions, the Committee soon found, in common with many other similar bodies, that its work naturally led to a study of the plant and operational methods in use in the industry.

Dr. Dunningham continued: The manufacture of moulding powder is essentially a highly specialized chemical process, and involves the use of a wide variety of well-known plant, such as mixers, grinders, dryers, stills, &c. Moreover it is confined almost entirely to large firms maintaining a technical staff of sufficient size to ensure efficient operation of its various processes. This branch of the industry therefore offers little scope for original investigation by a central body such as the Fuel Efficiency Committee. The moulding of these powders, under the influence of temperature and pressure, into a multiplicity of commercial products, is, however, widespread among a large number of manufacturers, many of whom operate upon quite a small scale. The plant used consists mainly of hydraulic presses and/or extruders. The latter may be of a highly specialized construction, but the former are merely adaptations of the ordinary hydraulic press to enable the material treated to be raised to a temperature at which it will flow under pressure. These presses, whether heated by steam, gas, electricity, or other means are, from a thermal point of view, very inefficient, and it would appear that the matter has never received any careful and systematic consideration by the plastics industry, which owing to its youth has been fully occupied with the many questions involved in its technical development.

The manufacture of laminated materials lies somewhere between the powder-making and moulding sections in that, while a variety of plant may be employed in the preliminary preparation of the materials, hydraulic presses of the multi-daylight type heated in the same way as the ordinary moulding press are also employed. This widespread use of presses throughout the industry, together with the known inefficiency of the methods of heating, has led the Fuel Efficiency Committee to investigate not only the relative merits of the various methods of applying heat, but also the distribution of heat itself to the various parts of the press.

About 75% of the fuel consumption is for "process," the remainder being used for power and space heating, with about 6% for "other purposes." We have, said Dr. Dunningham, experienced considerable difficulty in interpreting this allocation, but we believe that the fuel allocated to "process" includes both the heating of the presses and the power used to drive the hydraulic pumps. We are of the opinion that the amount required for heating the presses would be of the order of 75%, leaving 25% for the hydraulic pumps. If then we assume the total coal equivalent consumed by the industry as 250,000 tons, the moulders' section will use 40% of this—that is, 100,000 tons, of which 75%, or 75,000 tons, will be used for "process." If again 75% of this is for heating the presses, the total consumed for this purpose will be 56,000 tons a year. This calculation makes no allowance for the fuel consumed in heating presses used in the manufacture of laminated materials, which may easily amount to another 10,000 tons. When it is realized that only 2 to 3% of the total heat applied to a press is transmitted to the moulding powder, it will be seen that the potential economies in coal are very considerable.

The allocation of the total coal equivalent used by the industry between the various forms of heat and power is given in the following table.

Fuel.	Average %.
Coal	62.3
Coke	4.2
Electricity	22.9
Gas	3.7
Oil	6.0
Purchased steam	0.9

The figures refer to the total consumption of the industry for all purposes.

In steam-heated presses the steam actually used in practice will have to cover the losses in transmission and in condensate and flash, together with any leakages arising from faulty steam traps or other causes, including exposure of the press to draughts. The losses may vary considerably according to the efficiency of lagging of steampipes and connexions and the general maintenance of the plant. In the case of gas, heat is lost in the products of combustion, the amount depending on the design and efficiency of the burner, whereas in the case of electricity the efficiency of application will obviously be high, as there are no combustion or transmission losses.

The following table compares the calculated and actual requirements of steam, gas, and electricity per sq.ft. of total platen area per hour, and shows in each case the coal required to generate these quantities, assuming a platen temperature of 250°F. above atmosphere at 70°F.

It will be seen that gas requires considerably less ultimate coal than do either steam or electricity, the gas consumption being equivalent to 0.15 lb. coal/hr./sq.ft. total platen surface as compared with 0.35 lb. for electricity and 0.42 lb. for steam, taking the higher boiler efficiency.

From the point of view of coal usage gas is thus by far the most economical, with the added advantage that many valuable by-products are conserved for use in industry.

Comparison of Steam, Gas, and Electricity.

All quantities per sq.ft. total platen area per hour at 250° F. temp. diff.

Heating media.	Calc. heat, sq.ft/hr.	Average efficiency.	Industrial consumption, sq.ft./hr.	Equivalent coal.	Cost of heating, pence/sq.ft./hour.	Basis of cost.
Steam at 140 lb./sq.in. gauge	0.825 lb.	28%*	2.94 lb.	(a)0.42 lb. (b)0.49 lb.	0.118d.	Steam at 7s. 6d. a ton.
Gas at 450 B.Th.U.	1.58 cu.ft.	50%	3.16 cu.ft.	0.15 lb.	0.128d.	Gas at 9d. a therm.
Electricity	0.209 k.w.h.	90%	0.23 k.w.h.	0.35 lb.	0.116d.	Electricity at ½d. a unit.

* On latent heat only.

A photograph taken during the visit of the Manchester District Association of Gas Engineers to St. Helens last month. It includes the President, Secretary, and Committee Members of the Association, the Mayor of St. Helens, and the Chairman, Engineer and Manager, and Deputy Engineer of the St. Helens Gas Department.

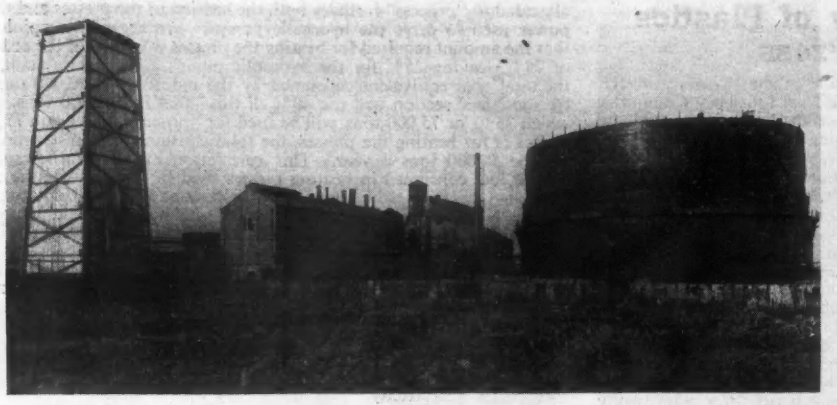


FIG. 1.—*General view of hydrogen plant showing generator house, purifier house, hydrogen gasholder, and cooling tower.*

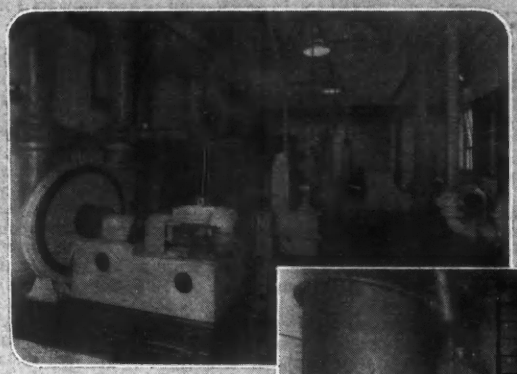


FIG. 2.—*A view of the booster and pump room.*

FIG. 3.—*Operating floor of generator house showing mechanical operating gear.*

FIG. 4.—*Gas compressors. Four stages compressing to 3,200 lb. per sq.in.*

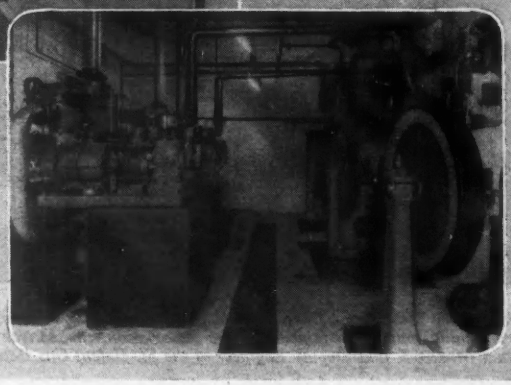


FIG. 5.—*Exhausters and caustic soda circulating pumps.*

The Balloon Barrage

The photographs on this page are of the plant at the Bournemouth Gas-Works for the production of hydrogen for the balloon barrage, an account of which was given in the "JOURNAL" of Dec. 6 and 13 last.

The Gas Supply Company, Melbourne, has declared a dividend of 4% for the year ended June 30, 1944, against 3½% for the previous year. Profit for the year was £13,968, an increase of £1,527, despite the fact that taxation and depreciation took £11,950, against £8,300 in the previous year. Sales of appliances were restricted under National Security Act regulations, and the necessity for economizing in the use of coal further restricted sales of gas. Nevertheless the demand for gas for such essential purposes as hospitals, munition works, and canteens for the services was very great. The volume of sales was 17% above the previous year, 47% above 1939, and 160% above ten years ago.

British Coal Distillation, Ltd., announces that it has acquired the option to purchase an anthracite colliery as a going concern for a consideration payable in cash, shares, and debentures. The Directors state that experts' reports estimate the reserves of high-quality anthracite at over seven million tons. An output of 100 tons per day can be reached within seven months, to be increased within twelve months to 300 tons per day. It is added that a group of industrialists has been interested by the Directors in the proposed purchase and reconstruction of the Suncole (Nottingham) Works and plant, and is now considering whether it is possible for measures to be taken to enable the plant to be modernized with tar-distillation unit added. The Company's accounts for the 19 months to July 31 last show a loss of £5,935, increasing the debit to £40,148.

The Stockport Gas Showrooms during December were the centre of much activity. During the early part of the month cookery demonstrations, in conjunction with Messrs. Alfred Bird & Sons, Ltd., were held, the initial demonstration being opened by the Mayoress of Stockport, Mrs. W. J. Davies. During the period there were twelve lectures, attracting an average attendance of 80. On the 5th of the month a Model Kitchen was opened by the Mayor of Stockport, Councillor W. J. Davies, J.P. In his introductory remarks Councillor S. J. Hall, the Chairman of the Gas Committee, stated that the object of the exhibition was to enable the general public to see the Kitchen, and if, after inspection, they had any criticisms, to avail themselves of a suggestion book placed near the building. The exhibition has attracted a considerable number of interested visitors, and the number will doubtless be materially increased by the time the exhibition closes on Jan. 13. Running concurrently with this exhibition has been one organized by the Stockport Waste Paper Recovery Association, "Waste Paper Presents Arms," which, like the Model Kitchen, has been a centre of attraction as showing the various war uses of paper.

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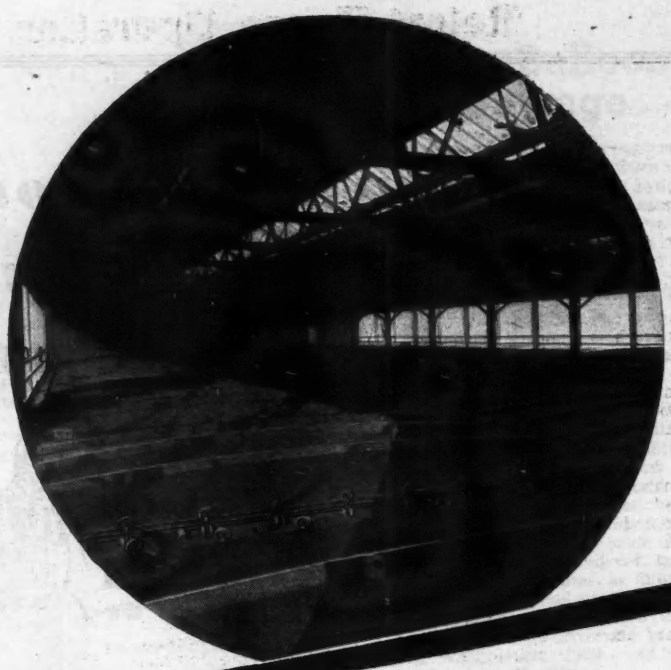

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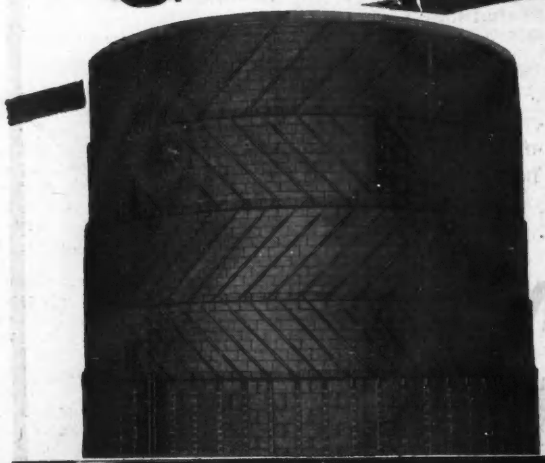
GAS HOLDERS



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Retort House Operation and Control*

By C. A. DEAS, Tottenham and District Gas Company

THERE are horizontal houses where improved results could be readily obtained by a little better organization and control, together with a fuller appreciation of the essentials necessary for maximum fuel economy. Working conditions are of extreme importance, and are apt to be overlooked when the installation of new plant or alteration to existing plant is under review.

No matter how well the plant itself is maintained, unless the working conditions are reasonably good and properly organized, the attainment of the highest efficiency is wellnigh impossible.

Under working conditions are classified: Ease of operation of plant by the introduction of modern labour-saving devices, and cleanliness of plant and buildings. Nothing is to be deplored more than such conditions as accumulations of dust on the top of the retort bench, and subways made the dumping grounds for sundry materials of little or no value. Limewashing of tar trays, fenders, bridge pipes, &c., does much to prevent the accumulation of tar by making it easy of removal, and also encourages cleanliness and tidiness. Adequate ventilation and lighting, both natural and artificial, are essential; regular limewashing of retort house walls will assist materially to this end. Why cannot a retort house have as high a standard of lighting, both naturally and artificially, as would be provided in any modern factory? Is it really economy to provide the minimum of lighting, and depend on the flare from charging operations to supply the deficiency?

Good changing, washing, and messing accommodation is essential. Even with older houses much could be done to improve working conditions.

Until the day comes when the dustless and smokeless retort house is produced, there will always be room for the improvement of working conditions by the installation of extraction plant to remove dust and smoke from the retort house, particularly during charging operations, but its cost is likely to prove high, and there remains the problem of dealing with the dirt, &c., so collected. The provision of a small extraction plant for general cleaning in the retort house—*i.e.*, tops of retort benches, walls, ledges, &c.—is probably a more practical proposition from the point of view of cost.

Retort settings and ancillaries, coal and coke handling plant, and all other retort house machinery must be maintained in good condition by systematic inspection and regular repair. A maintenance fitter or fitters, according to the size of the house, should be detailed for this work. All retorts should be carefully examined each time they are off for scurfing, and any cracks and holes plugged with a suitable hot patching cement. Producer feeder covers, clinker doors, flue inspection and cleaning plugs, &c., should be regularly inspected for tightness, and the necessary repairs or adjustments made. Limewash is very efficient in sealing up leaky brickwork.

Tightening-handles of self-sealing retort lids should be daily inspected and adjusted as necessary, but for this to be effective, mouthpieces and lids must be cleaned with a scraper each time they are opened for discharge. Retorts and fittings—*i.e.*, mouthpieces, ascension pipes, and bridge pipe joints, &c.—of all retorts at work should be put under five-tenths test pressure each day; any leakage of retorts or ironwork is readily discernible and rectified.

When resetting work or other major repairs are carried out, consideration should be given to the possibility of introducing improved design of plant—*e.g.*, silica retorts, if not already in use, thinner cross walls, recirculation, deepening and widening of producers (most old houses suffer from inadequate producers), anti-dips or Congden standpipes, water flow coke conveyor, &c.

The weight of charge has an important bearing on the smooth running of the retort house and, to a lesser degree, the purifying plant. The best all-round results are obtained by completely filled retorts, which give maximum coal throughput, which in turn gives minimum fuel consumption in the producers, reduces stopped pipe troubles, eliminates naphthalene trouble, minimizes scurf formation, and requires the least expenditure of labour for a given coal throughput. It requires the same amount of labour to push out and recharge a 10-cwt. charge as it does a 16-cwt. charge, and the latter takes little longer. The wear and tear on the charging machine, retort mouthpiece doors, &c., is less, because something like two-thirds of the number of operations are necessary in a day to carbonize, say, 30 cwt. of coal with 16 cwt. charges, as against 10-cwt. charges. There is a gain in thermal efficiency, because the loss of gas during charging operations is also in direct relation to the number of charges.

Ascension and bridge pipes, offtake pipes, &c., must be maintained free of deposit if the gas from the charge is to get away freely. Heavy charges have already been mentioned as one means to this end, but it is necessary regularly to short-auger each pipe every time the retort is opened for discharge, and here attention is drawn to the regular inspection of auger heads to ensure that they are kept up to size. In addition, each time retorts are off for scurfing, the caps should be removed and the pipes allowed to "burn out" and long-augered from the bottom and the bridges augered from the top. These operations, if systematically carried out, will be found materially to assist in keeping "stopped pipes" down to a minimum. With regard to the gas offtakes, a liquor spray in each of these will be found to maintain them completely free of deposit.

"Pull" in the retorts is to be avoided like the plague; level gauge to a very slight pressure in each retort is to be aimed at. In practice, however, the maintenance of the same pressure conditions in each retort is impossible, owing to the varying "stack" effect of each ascension pipe, due to different lengths of pipe to each tier of retorts, and the state of carbonization in each retort. Towards the end of the carbonizing period there appears a definite tendency for this "stack" effect to increase. To compromise, the middle tier of retorts, it is suggested, should be the controlling retorts. Some means of controlling pressure conditions inside the retort is, of course, essential, and for good conditions retort house governors, together with exhauster governors, are a necessity.

The tendency to install elaborate governors capable of working to a hundredth of an inch seems superfluous. There seems much to be said in favour of the simpler type of bell governor, which in the writer's experience gives sufficiently close governing. After all, if retorts will stand a pressure of five-tenths of an inch without leakage, and this they certainly should, it seems hardly likely that a variation in pressure conditions of up to one-tenth is likely to be of material importance, particularly when the varying "stack" effect of the ascension pipes, already mentioned, is remembered.

Steady heats are necessary, and depend to a great extent on the regular filling and cleaning of producers. Many retort houses, particularly those of early date, suffer from inadequate producers, particularly from the point of view of depth. The only way to counterbalance this evil is to fire more often, and take great care that the operations of "firing" and cleaning are so arranged as to avoid a fire being low immediately prior to cleaning, or being left unfilled for any period after cleaning.

The real remedy for small producers is to consider the possibility of deepening and widening, which can often be done without serious structural difficulty, and from the writer's experience is well worth the trouble and expense.

Regular cleaning of flues is necessary, together with waste gas analyses and the daily observation of combustion chamber heats, coupled with visual examination of retorts immediately after discharge, and the hot coke as it is discharged. The importance of seeing that flue-cleaning plugs, sight boxes, clinkering doors, &c., are maintained in sound condition cannot be over-emphasized as having a bearing on the maintenance of steady heats.

The provision of a complete operating schedule is essential if retort house routine is to proceed smoothly, and this applies also to the small stop-end house of, say, four to six beds. The retort charging schedule should clearly show which retorts are to be discharged and charged on each round, and the order in which they are to be dealt with. It should also show which retorts are to be used for firing-up producers and which are to be left for scurfing.

A fire cleaning and filling schedule should be prepared, bearing in mind the necessity, already referred to, of co-ordinating the two operations. Failure to co-ordinate these operations will often be found to be the cause of burnt-out producer arches. The practice of waiting until the producer is sufficiently low to take a full charge is to be deprecated. Fires should be filled at regular intervals, whether they will take a full charge or not. This remark does not, of course, apply to really large capacity producers, 12 to 14 ft. deep, when a certain amount of fluctuation in the fire level, to enable a full charge to be put into the producer, is permissible.

To simplify these schedules, the writer adopted a scheme many years ago of giving each retort in a bed a letter, the top left hand retort being "A" reading from left to right, the next is "B," followed by "C," &c., so that in a bed of eights containing two horizontal rows of three retorts and a bottom row of two, the top row would be "A," "B," "C," the second row "D," "E," "F," and the bottom row "G" and "H."

To identify a particular retort in the house one merely takes the letter of the particular retort and prefixes it with the number of the bed—*e.g.*, 1A would be the top left-hand retort in No. 1 bed; 6A would be the same retort in No. 6 bed, and so on.

A regular scurfing cycle should also be prepared so that there are always a constant number of retorts "off" scurfing. Incidentally, it will be found of great benefit to carry out this operation at far shorter periods than is often the case. It is suggested a cycle should be worked to ensure each retort being scurfed at least every 16 days. The result is a shorter scurfing period; 24 hours as a maximum is usually sufficient to get retorts quite clean, without the use of such implements as scurfing bars. Average scurfing period is of the order of 16 hours. Frequent scurfing also results in the pipes keeping in good condition, and the opportunity of inspection and patching of retorts at each scurfing ensures their being maintained in a good state of repair. The possibility has been considered of carrying out scurfing by leaving off retorts for a short interval each time they are discharged. With Congden standpipes this procedure (known to be in operation)

* Paper read to the Southern Association of Gas Engineers and Managers (Eastern District) on Dec. 13, and to the London and Southern District Junior Gas Association, Dec. 15, 1944.

has much to commend it. When, however, ascension pipes are in use, the method suffers from the drawback that it does not give opportunity for thoroughly cleaning the pipes. One of the most important advantages of frequent scurfing is often overlooked, that is its effect on the capacity of the retorts, also the rate of heat transfer from the heating gases to the coal charge. Obviously space occupied by scurf is not available for coal, apart from its bad heat transfer properties. At the writer's works, the progressive shortening of the scurfing interval has assisted in bringing the average weight per charge up to 16 cwt. in a 24 in. by 16 in. "Ω" retort 20 ft. long.

To prevent overlapping of duties, it is a good plan to have each man's duties clearly posted up in the retort house; this also assists in securing equitable distribution of work between operatives.

Regular analysis of producer and flue gases is helpful in controlling heats, and ensuring that the coke in the producer is burnt at maximum efficiency. A figure of 18–20% CO_2 in the waste gases should be aimed at.

Regular determination of the inerts content of the coal gas immediately after the outlet of the retort house is useful as an indication of the soundness or otherwise of the retorts. Figures of the following order should be readily obtainable:

CO_2, 1.5%; O_2, 0.5%; N_2, 2.5–3.0%.

Anything higher calls for further investigation—*e.g.*, by carrying out analysis of the gases from individual settings, testing for leaky retorts, joints, &c.

A complete record of all waste gas and air slide openings, main flue pull, &c., is useful, and will be found invaluable in dealing with irregularities which occur from time to time and when bringing heats up from cold.

It is hardly necessary to mention waste heat recovery as a means of improving fuel efficiency; all but the smallest retort house of, say, three or four beds should be so equipped. Obviously every endeavour should be made to maintain as high a CO_2 as possible in the gases at the inlet of the boiler, and it is well worth while spending time to track down and seal up as many as possible of the small leaks which have such an adverse effect on the performance of the boiler. A figure of the order of 14% CO_2 should not be impossible of attainment if flue brickwork and settings are in a reasonably good state of repair. For fuller information on this aspect of fuel economy, I would refer you to the Paper read to The Institution of Gas Engineers by Major Gregson in June, 1935.

The question of insulation of the retort bench has received the attention of the writer from time to time. The top of the retort bench is probably one of the greatest sources of avoidable heat loss, which is easily remedied by covering it with a layer of insulation bricks, which not only materially reduces the loss of heat, but encourages the keeping clean of the bench top, by making working conditions such that it is possible to walk about without burning the soles of one's boots.

Insulation of the front walls of the bench is not so simple, since the greatest loss of heat is probably from the ironwork—*i.e.*, mouthpieces and ascension pipes, which form quite a considerable area compared with the exposed brickwork. Building insulation bricks into the front walls would appear to have the great disadvantage of reducing the strength of the walls, unless they are thickened up, which has the drawback of encouraging "black ends" to the retorts. Another method is to cover the front walls with a layer of asbestos composition, similar to that used to cover boilers and steam pipes. This suffers from the disadvantage that it can only be put into position after the beds have been heated up, which makes a really good job difficult; moreover, the material is somewhat fragile, and from the writer's experience, after a year or so it begins to drop off. The problem should not, however, prove insuperable, and there may be others present who can give more successful methods of dealing with it.

Attention is also drawn to the not inconsiderable loss of potential heat which can occur by indifferent cleaning of fires and sorting-out of clinker and ash, resulting in quantities of coke of both large and small sizes finding its way on to the clinker heap.

The ultimate aim is, of course, the maximum throughput of coal per retort per day with the least expenditure of producer fuel, with the production of a high gaseous yield of low inert content, not overlooking the necessity of producing a coke suitable for domestic use, all with the minimum expenditure of labour. It is suggested here that the importance of coal throughput is often not sufficiently well appreciated. The highest coal throughput will be found to give the highest calorific value gas in addition to the most reactive coke, but not necessarily the highest therms per ton figure. In any case a high therms per ton figure does not necessarily mean the highest all-round efficiency. A high coal throughput will also be found to give the largest total yield of gaseous therms from a given size of carbonizing unit.

If charges are left in until every vestige of volatile matter has been driven off in order to obtain a high therms per ton figure, the calorific value of the gas will be lower, the coke will be less reactive, producer fuel consumption will go up, and the total thermal output of the house will show a decided drop.

Some recent improvements which assist materially in improving thermal efficiency and working conditions are:

The Flume Conveyor for handling hot coke from the retorts. This is far ahead of anything yet devised for the job in its efficiency and its economy in operation and improvement of working conditions. Anybody present who, like the writer, has used a drag bar conveyor and then a flume conveyor will appreciate this statement.

It may be of interest to refer to the difficulties that can occur from handling hot coke by the flume conveyor—that is, the liability to fire in the storage hoppers. It should be explained that the coke, as it leaves the flume conveyor, is passed *via* a system of band conveyors and elevator to a breaker, which can be by-passed, to the sizing screens, whence it passes into overhead concrete storage hoppers. This system ran perfectly smoothly for approximately 2½ years without trouble from fires, when one night a bunker containing about 60–70 tons of large coke was found to be well and truly alight. Fortunately, it was got under control and out of the hopper without damage to the structure. This fire was thought to have been due to a particularly bad consignment of coal, which upset retort heats, resulting in "patchy" carbonizing.

However, the same thing happened again a few weeks later, and when the hopper was emptied, it was decided to take the opportunity to remove the spiral chute, which was badly worn and required renewal, and was, moreover, in a dangerous condition. It was not, however, immediately possible to replace the chute, and the hopper was put back into commission without a chute. More fires followed at intervals, and matters began to get desperate, but the strange thing was that the large size bunker at the other end of the hopper (it should be explained that the coke plant is in duplicate) gave no trouble whatever, yet it received coke treated in exactly the same way.

A careful examination of all the facts showed the only difference between the two hoppers to be that the one in which fires occurred had, first, a very badly worn spiral chute, and finally none at all. The other had a spiral chute in perfectly good condition, and it was therefore thought reasonable to conclude that the trouble experienced was due to the coke, when dropping into the hopper without the chute, breaking and opening up the red-hot interior, which under favourable conditions re-ignited, whereas the spiral chute allowed the coke to travel down into the hopper with its black outside intact. Visual observation at night confirmed this fact, and experience since that time, about 12 months ago, has done nothing to alter this theory. While it is not suggested that this is the cure-all for hopper fires, it would certainly appear to be of no little importance. Since the appreciation of this factor no further fires have occurred.

Congden Standpipes eliminate the arduous job of pipe augering, do away with the mass of ironwork up the front and on top of the beds, resulting in a cleaner and cooler retort house, giving, without doubt, improved working conditions. There are difficulties which may prevent the introduction of Congden standpipes to existing retort benches, particularly the necessity of completely scrapping the whole of the existing ironwork. As a compromise anti-dips have much to commend them, and will be found to give trouble-free service over many years. Moreover, they incorporate the definite advantage of a hydraulic seal, whereas the Congden depends on a dry seal for tightness.

Recirculation, referred to by Mr. Muir Wilson in his Paper to the London and Southern District Junior Gas Association last winter, enables retort throughputs to be pushed up without increase of combustion chamber temperature. Whether or not a reduction in producer fuel consumption per ton of coal is likely to result from its adoption has yet to be proved. Certainly adequate producer capacity seems necessary for the fullest benefits to be obtained. As an alternative, the same coal throughput can be obtained with lower combustion chamber temperatures.

Reduction of the thickness of cross-walls from the more conventional 9 in. to 4½ in. with wider flue spaces helps heat distribution and consequently the rate of coal throughput. Front walls of 11 in. instead of 14 in. assist in the avoidance of "black ends." Again, the importance of doing everything possible to increase the size of the producers, both in depth and width, cannot be over-emphasized. Indifferent results can invariably be traced to inadequate producer capacity.

The following is a brief description of the horizontal retort house at the writer's works, together with the carbonizing results for the half-year ended June 30, 1944.

The house consists of three benches totalling 13 beds, each of eight retorts—eight three tiers and five four tiers. Cort's anti-dips are in use throughout, and there are two 6-in. ascension pipes to each retort.

Producers are 8 ft. 6 in. deep by 4 ft. wide, now being increased to 10 ft. 6 in. deep as the beds are reset. An extension in hand will have producers 4 ft. 6 in. wide by 12 ft. deep to serve four tier beds of eights.

The retorts are 20 ft. long, 24 in. by 16 in. Ω shape, silica segmentals with 7 in. cross walls and 9 in. flues and 11 in. front walls.

The two charging machines are Guest-Gibbons, and the hot coke is handled by a flume conveyor constructed in reinforced concrete, with a 2 in. blue tile lining on the bottom, and extending approximately 6 in. up the sides.

The coke is discharged over a cast-iron static bar screen into a small receiving hopper, from which it is conveyed *via* a band conveyor and an elevator to the screening plant.

Each bench is fitted with a bell type governor, the sealing medium being gas oil.

All gas offtakes have been fitted with liquor sprays, which have been found completely to eliminate stoppages, which did occur in these from time to time, particularly in warm weather.

Recirculation has been introduced into one bench of retorts which was reset this summer. It is too early yet to express any personal opinion on the merits or demerits of the scheme, though inspection of similar systems at other works well justified its adoption.

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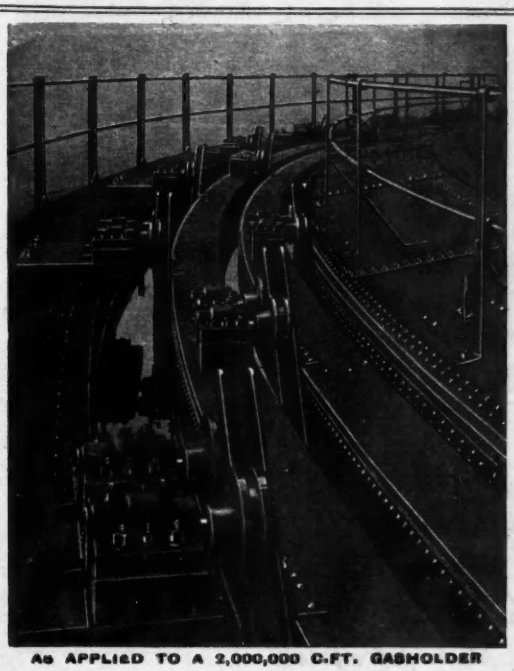

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never needed cleaning, adjusting or attention of any description"—

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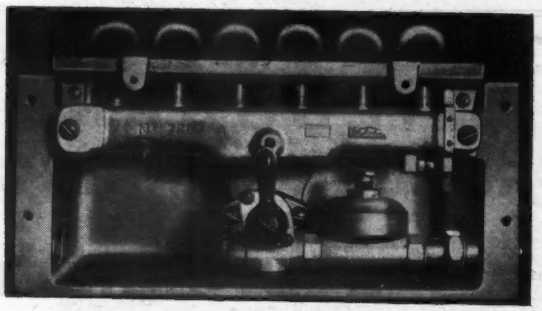
"I have taken particular interest in this design since its placing on the market. I have had one in use for some three years in an all-gas flat, and it has had heavy use, particularly during the winter months. During this period it has never needed cleaning, adjusting or attention of any description, and in my opinion is the ideal gas fire of the future. All the troubles experienced with earlier models are absent—blockage of the burners with dust, etc.—needing attention and adjustment at least every six months, discoloration of radiants causing loss of radiant heat, and pressure and C.V. variations causing differences in efficiency.



Incidentally, the general belief of the public that a gas fire causes a feeling of 'burning' at the front and 'coldness' at the back, when sitting in front of a gas fire, seems to be entirely absent with the Silent Beam."

SILENT BEAM

Gas Fires

C.

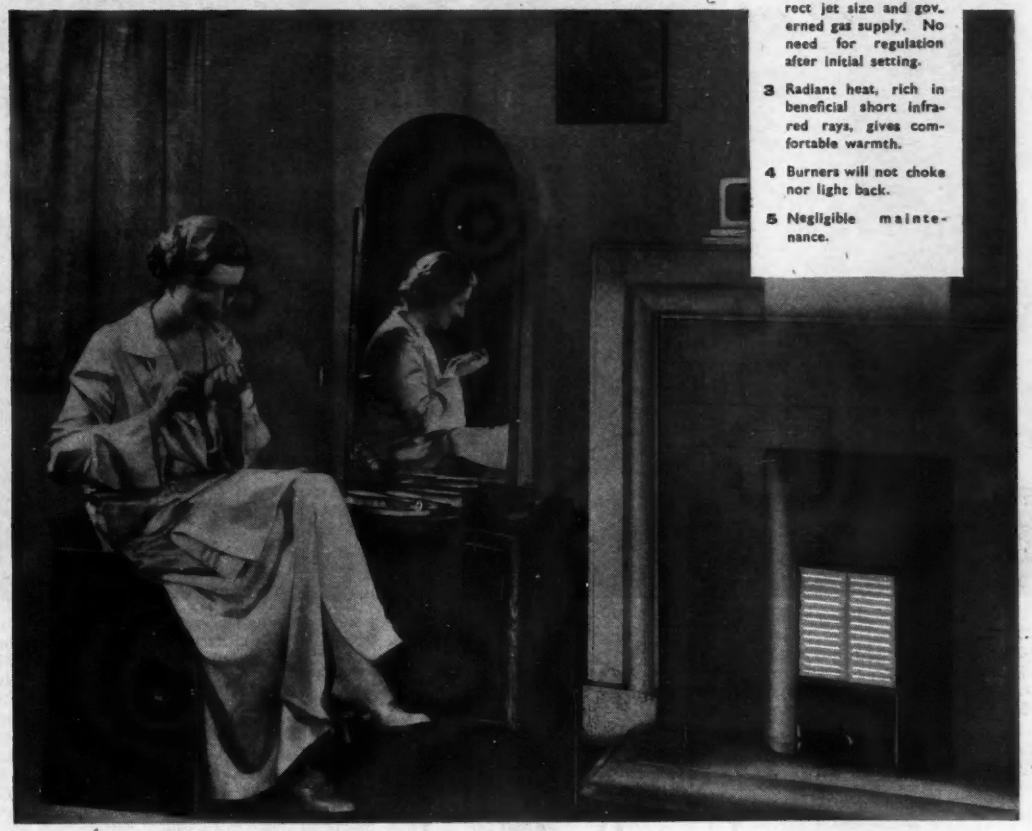
1 Silent in operation.

2 A definite heat output is determined by correct jet size and governed gas supply. No need for regulation after initial setting.

3 Radiant heat, rich in beneficial short infra-red rays, gives comfortable warmth.

4 Burners will not choke nor light back.

5 Negligible maintenance.



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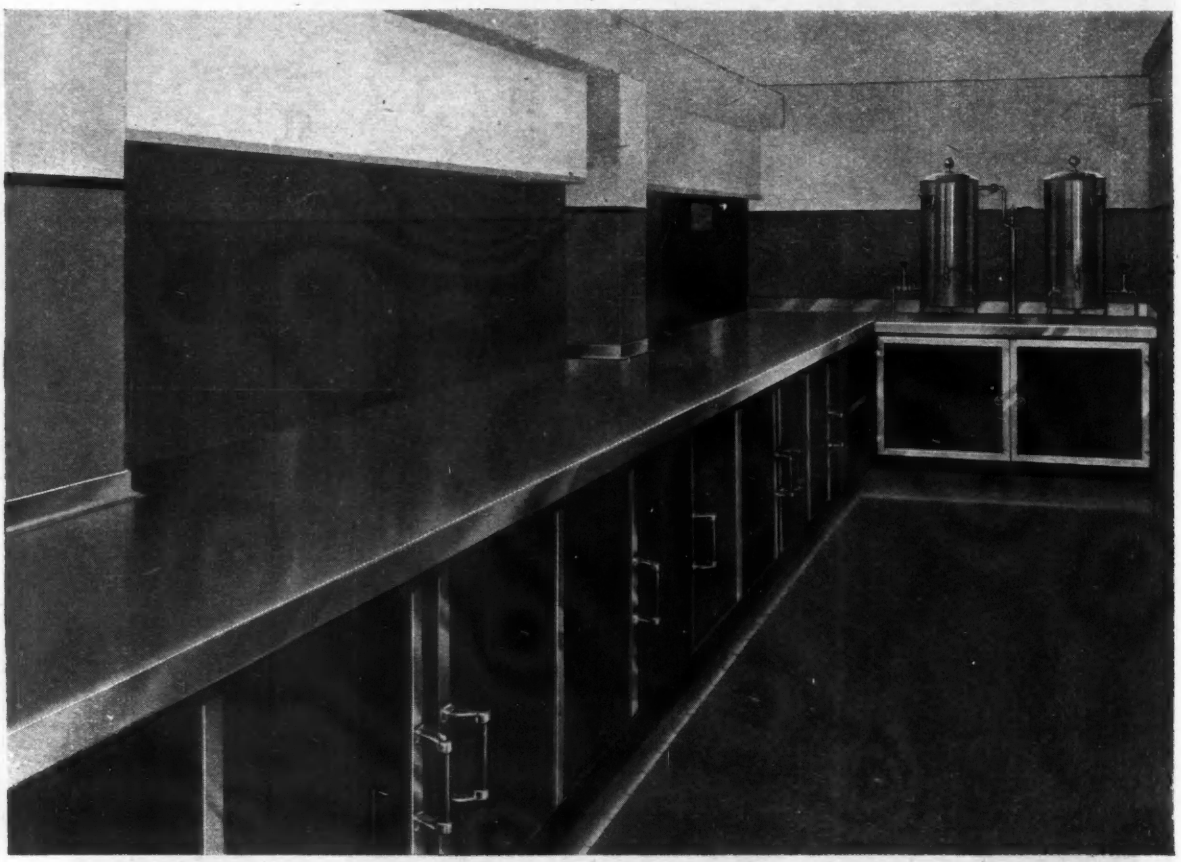

View of part of the Staff Service of a large Canteen Kitchen Installation by

Visit
THE KITCHEN PLANNING EXHIBITION
DORLAND HALL
LONDON, S.W.1
Feb. 6—Mar. 3

R. & A. MAIN LIMITED
LONDON AND FALKIRK

Coal Gas Carbonizing Results—Half-year ended June 30, 1944.

Coal carbonized 100% Durham (nuts, singles, and unscreened as available).

Average weight per charge, 15.8 cwt.
Average coal throughput per retort per day, 1.66 tons.
Average carbonizing period, 11.5 hours.
Average period each retort worked between scurfing, 16 days.
Calorific value of gas at outlet of retort house, 606 B.Th.U./cu.ft.
Inerts content of gas at outlet of retort house:
CO_2, 1.6%; O_2, 0.4%; N_2, 2.6%
Calorific value of gas after oxide purification, 575 B.Th.U./cu.ft.
Therms per ton of coal, 71.6.
Coke made for sale per ton of coal, 10.4 cwt.
Breeze " " " 1.6 "
Total coke and breeze ditto, 12.0 cwt.
Coke used retort house producers, 2.8 cwt. (calculated).
Tar made for sale per ton of coal, 10.0 gall.
Average moisture content of coke:
No 1 size 4.6% (water added to reduce dust nuisance).
No. 2 " 4.3%
No. 3 " 12.6%
Breeze 16.6%
Weighted average for coke and breeze, 7.6%.
Crude benzole—gallons per ton of coal—3.0.
Hydrocarbon enrichment value, 35.8.
Fuel usage index, 17.3.
Average working life of retorts under fire during period Jan. 1 to June 30, 1944, 1,180 days.

Raw materials for gas-making.	Quantities.		Calorific values.	Total thermal content.	% thermal content for sale.
Coal	1 ton		305 therms/ton	305	...
Products of carbonization.					
Coal gas	12,455				
Less gas used on works	—				
Less thous. as benzole	117	12,338	@ 544 B.Th.U./cu.ft.	67.1	22.0
Benzole	3.0		@ 1.5 therms/gallon	4.5	1.47
Coke and breeze for sale: 12.0 @ 8.0% H_2O = 11.5 cwt. @ 4.0% H_2O	11.5 cwts.		@ 280 therms/ton	161.0	52.8
Coke and breeze for producers	2.8		@ 280 "	39.0	...
Coal gas tar for sale	10 galls.		@ 1.8 therms/gall.	18.0	5.9
H_2S, thick tar, NH_3, &c.			@ 1.6 therms/ton/coal	1.6	.53
					82.70
			Fuel usage index	...	17.30

Attention is drawn to the high calorific value of the retort house gas. Incidentally, when 100% Yorkshire coals were carbonized under the same conditions a figure of the order of 630 B.Th.U./cu.ft. was readily obtained, with a yield of some 73 therms per ton.

It is suggested that these high calorific values are attainable without any loss of thermal efficiency. Any attempt at dilution in the retorts by "overpulling" or "steaming" is inefficient. Briefly, retorts should be used to carbonize coal, and thus produce the maximum possible quantity of high calorific value gas, diluted afterwards as necessary, by the admission of producer gas and/or water gas as desired. Partial dilution by benzole recovery is assumed. For further information on producer gas dilution see the Paper read by the writer in November, 1936, and in support of the experience on "Steaming," see the Paper read by Mr. Braidwood to the Southern Association in November, 1935. A retort is a very inefficient water gas generator, and any attempt to use it as such results in a drop in coal throughput, and consequently thermal output, and an increase in producer fuel consumption.

It is convenient to digress for a moment at this point to suggest that these remarks apply equally to vertical retort installations, particularly of the intermittent type. Is it really sound fuel economy, or for that matter sound financially, to steam down to the desired calorific value, as is more often than not the usual practice with vertical installations? Surely it is better, if water gas is required as a diluent, to produce it under controlled conditions, in a plant designed expressly for the purpose.

It would appear questionable to put up expensive plant, provided with special refractories, &c., and then proceed to use something like 20% of its useful life for the very inefficient production of water gas.

As an alternative it is suggested that the aim should be to produce the maximum number of high calorific value coal gas therms per retort, which, after benzole recovery, should be diluted to the desired calorific value with producer gas or water gas manufactured in a plant designed for the purpose. The effect of this would be to increase the coal throughput of the plant as a whole, probably up to something like 25%, and the gas output proportionately.

Producer fuel consumption would be expected to show a decrease of something of the order of 3 lb. of coke per 100 lb. of coal, apart from an appreciable drop in the production of ammoniacal liquor, and some saving of fuel consequent on the reduction in the steam requirements of the plant.

More coke for sale and benzole would also result from a given size of plant. As an illustration of the point in question, assume an intermittent retort house having, say, 20 3½-ton retorts, and a delivered gas calorific value after benzole extraction of, say, 460 B.Th.U.

(*a*) Steamed to produce a gas having a calorific value of 490 B.Th.U. at inlet of benzole washer;

(*b*) The same retort house with the lowest possible steaming, the resultant coal gas being diluted with producer gas, to give a 490 gas at inlet of benzole washer,

the results might be expected to be somewhat as follows:

	Steaming.	Minimum steaming.
Calorific value of gas	490	560
Percentage of steam on coal carbonized	10	1½
Period of steaming—hours	3	½
Duration of charge—hours	13	10.5
Coal per chamber per day—tons	6.3	7.8
Therms per chamber per day	529	577
Therms per ton of coal carbonized	84	74
Cubic feet per ton of coal carbonized	17,140	13,210
Producer fuel per 100 lb. of coal carbonized	15.9 lb.	12.6 lb.
Volume of producer gas at 120 B.Th.U./cu.ft. to dilute to 490 B.Th.U./cu.ft.	*Nil*	2,516 =16%
Coke required for producer gas manufacture per 100 lb. of coal carbonized	*Nil*	1.57 lb.
Cu.ft. of 490 B.Th.U./cu.ft. gas per retort per diem	108,000	122,660
Total quantity of gas per diem	2,160,000	2,453,200
Percentage increase of gas output, non-steaming plus producer gas, over steaming	—	13.5

It will be noted that there is a difference in producer fuel consumption between steaming and minimum steaming of 3.3 lb. per 100 lb. of coal carbonized; this amounts to some 74 lb. of coke per ton of coal.

Converted to water gas in an external plant, this 74 lb. of coke might be expected to produce some 6 therms of gas, which, added to the 74 therms of coal gas, gives an output per retort of some 624 therms of 520 B.Th.U. gas, compared with the 529 therms of 490 B.Th.U. gas resulting from the same retort with 10% internal steaming.

Using blue water gas made in a separate plant as a diluent the make per ton would go up to approximately 17,600 cu.ft. of 490 B.Th.U. gas, giving a make per retort of 137,000 cu.ft. per diem, or on the 20 retorts 2,740,000 cu.ft.—*i.e.*, 27% increase on the output obtained when steaming down to 490 B.Th.U./cu.ft.

560 B.Th.U./cu.ft. has been taken as a calorific value fairly readily obtainable. It would be interesting to ascertain from actual practice whether a figure more closely approaching good horizontal practice could not be obtained, in which event the case for external dilution would become more marked.

It is suggested that the figures given are of sufficient importance to justify further investigation, and may even eventually result in steaming as it is carried our to-day on vertical retorts being very much curtailed on future plants.

A glance at the table of results, incorporated in the Paper "Intermittent Vertical Chambers and Coal and Coke Handling Plant at Southall," read at the Institution meeting in June, 1931, will be found to give practical confirmation of the point illustrated. At the same time it is as well to remember that the producer gas thus added will be cheap therms added to what will be the cheapest retort house therms.

Power Supply.—The question of whether works power requirements should be met by electricity, steam, gas, or other means is outside the scope of this Paper, and it is proposed to assume that most engineers nowadays appreciate the advantages, both practical and economical, of electric drive wherever possible. It then becomes a question of the most suitable source of supply conducive to maximum fuel efficiency, not overlooking cost.

It is usual in the majority of cases for gas-works to generate their own electricity, more often than not by steam-driven generators. Reasons put forward for this are: Reliability, more economical, makes use of waste heat steam when available. Is, however, electrical generation a suitable load for the waste-heat boiler? To begin with, the electrical load on a gas-works varies considerably from hour to hour throughout the day, while the steam production from the waste-heat boiler is steady throughout the 24 hours. If the steam used for electrical generation is taken from the waste-heat boiler, then the bulk of the steam required for the exhausters, scrubbers, benzole and Dri-gas plants must of necessity be generated in solid fuel boilers. These latter steam consumers are steady throughout the 24 hours, and since their requirements are also pretty well in direct proportion to the amount of coal carbonized, the amount of waste heat steam available always bears a direct relation to their requirements. The writer suggests therefore, that essentially steam driven units of the type mentioned are ideal consumers for the waste heat boiler steam output.

Assuming it is agreed that these units be steam driven, then the writer suggests that all other power requirements should be supplied by electricity, which if generated on the works and by steam-driven generators, will require solid fuel boilers to produce the major portion

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of the necessary steam. Carburetted water gas plant steam requirements should be provided either by their own annular and waste-heat boilers, or by solid fuel boilers worked in conjunction with the plant.

Alternate sources of supply are gas engine generators (town or producer), oil engines, or bulk supply.

Supposing it were decided to adopt one of the alternatives, and that the requirements of the steam-consuming units mentioned above are to be provided by the waste-heat boiler, it is possible that there may be a surplus of waste-heat steam available which cannot be absorbed. This, however, will depend very much on the efficiency of the steam engines in use, type of carbonizing plant, and size of works.

Suppose this state of affairs does arise, what is the answer? Is it better to make use of solid fuel boilers to augment the surplus waste heat steam available, in order to meet the steam requirements of one's own electric generators, or would it not be better to endeavour to reduce the amount of waste heat steam down to the quantity required for the essential steam plant by improved retort house fuel efficiency, and/or by improvement in design, to enable more of the heat in the waste gas to be returned to the setting, aiming at an ultimate reduction in the amount of coke consumed per ton of coal carbonized?

Any attempt deliberately to produce sufficient waste heat steam to meet the requirements of the essentially steam-driven plant and electrical generation, by, for example, the elimination of regenerators, comes immediately up against the difficulty of constant steam output, against varying power and consequently steam demand. In other words, there would still be surplus waste heat steam available at intervals throughout the day. It is practically certain that in the majority of cases the steam requirements of the electrical generators would be provided by solid fuel boilers, which when burning 100% breeze of ½ in. down to dust, are not likely to produce much more than 4 lb. of steam per lb. of fuel.

The average consumption of steam per unit for a high speed engine generating set of, say, up to 100 kw., the size of unit likely to be found on all but the larger works, working non-condensing is likely to be of the order of 50–55 lb., giving a fuel consumption of 12–13 lb. of breeze per unit of electricity.

Condensing engines would undoubtedly show an improvement on these figures, but whether or not their installation, together with the necessary ancillaries, would show any ultimate saving on units up to, say, 100 kw. is a debatable point. Fairly large quantities of cooling water would be required, which would need to be pumped. A cooling tower also would be necessary, unless one were fortunate enough to have a handy river or stream, the contents of which could be used without limitation.

A factor which has an important bearing on the steam consumption of the average gas-works electric generator is the difficulty of maintaining a good load factor. consequent on the heavy intermittent loads of such units as coal tippers, stoking machines, coal crushers, and the like. The generator must necessarily be large enough to handle these peak loads, consequently it is doubtful whether the load factor is even 50%. It is suggested, therefore, that in considering replacements or extensions of existing generating plant, the claims of the alternative sources of supply mentioned require careful consideration, and may show not inconsiderable improvement in works fuel efficiency.

Having decided to use one of the alternatives, what are the likely outlets for the breeze, which would not then be required for the works boilers?

Using it as breeze it can be:

(*a*) Burnt under boilers to provide steam for water gas manufacture.

(*b*) In the case of a large undertaking, or group of undertakings with a number of works, used to provide process steam at a central by-products works, to which the breeze could be sent from the various gas-works.

(*c*) Sold to consumers requiring large quantities of process steam or hot water. If it can be successfully used on the gas-works or by-products works for steam production, then it would appear not to be impossible to dispose of it to these consumers, providing they are instructed as to the correct manner of burning it, and the right type of furnace to use in the boiler.

(*d*) Its use for the manufacture of producer gas has possibilities, and the writer has successfully used it for this purpose on a small scale. There are undoubtedly practical difficulties in dealing with it on a large scale. One of the most serious drawbacks is the fact that a given size of producer plant will handle considerably less breeze per hour than coke. In other words, its rate of gasification is undoubtedly slow, and while this is perhaps not of such importance with small units, it can be a serious matter with larger plants.

(*e*) Upgrading by screening.

It would appear that there is a potential demand for fuel graded ¼ in. to ⅜ in. for the smaller size of coke boilers. In fact it has been suggested to the writer by more than one coke salesman, that once such a fuel is made available, the main difficulty might be to produce sufficient of it.

The material from ¼ in. to dust might very well be returned to the coal charged to the retorts, and from investigation carried out by others in the past, this method of disposing of fine breeze has possibilities.

(Our report of the discussion will appear in a subsequent issue of the "JOURNAL.")

Women's Gas Council

It is considered that definite progress has been made during the year, and that a solid foundation is being laid for further development of the Women's Gas Council after the war. So ends the ninth annual report of the Women's Gas Council, which carries the history of that very energetic organization up to the end of last March. The report just circulated records continued close co-operation with Government Departments and many national organizations concerned in a variety of ways with improving the standard of home life. While most of the branch activities in the year under review were directed to war work—needlework for war comforts, help in service canteens, fuel economy campaigns, and so forth—effective work was done at headquarters in developing a wider understanding and appreciation of the service of gas to women, not merely by talks to women, but more especially by direct representation on such bodies as the Gas Installations Committee, the Domestic Heat Services Committee, and the Domestic Gas Advisory Committee, where the woman's viewpoint was essential in directing attention to the needs of the home. Our Annual Review of Dec. 27 dealt with most of the general items covered by the report, but it is useful to have this 20-page account of what was achieved in 1943–44, with its complete list of branches and officials, on our files for permanent reference.

Liverpool's New Benzole Plant

The Ministry of Fuel and Power has given permission to the Liverpool Gas Company to erect a benzole plant capable of debenzolizing and desulphurizing up to 7½ million cu.ft. of gas daily.

This is thought to be one of the largest benzole plants to be installed in a gas-works during the war.

The new installation is to be erected at the Garston Works of the Company, which is rapidly being brought right up to date with the latest types of machinery.

Dr. M. Barash will be unable to give his Paper to the Manchester and District Junior Gas Association on Jan. 27, and, in the circumstances, it has been decided to cancel the January meeting. The next meeting of the Association will be held on Feb. 24, when Dr. J. G. King will deliver an Address.

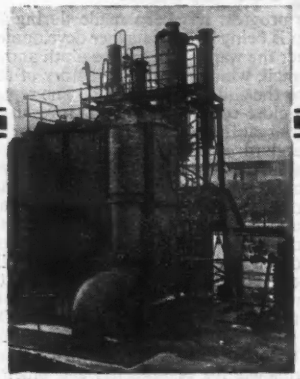
Southport Town Council has asked the Ministry of Works to authorize the installation of gas cookers, boilers, and refrigerators in all the prefabricated houses to be erected in the borough. An amendment that these appliances should be electrical was defeated by 21 votes to 20. It was stated that the Ministry had insisted on the use of electricity for heating.

In Reply to an Application for an Order increasing the maximum price of gas from 10.8d. to 1s. 2d. per therm, the Ministry of Fuel and Power has informed the Blackpool Gas Committee that it considers the present statutory maximum is more than sufficient for ordinary peacetime requirements, and suggests that if it is considered the price should be advanced, application should be made for a temporary, instead of permanent, increase.

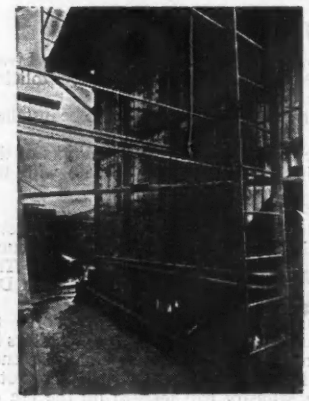
The Representative of Messrs. Drakes Limited, Constructional Gas Engineers, Mr. Francis D. Drake, is returning to Head Office to take up an executive position, and his area (Midlands and South-West) will now be visited by Mr. Albert Robertshaw. Mr. Robertshaw, who is a first-class carbonizing engineer, has spent his whole career with Messrs. Drakes, and his services are at the disposal of all who are in the area recently served by Mr. Francis Drake. Mr. Robertshaw's home address is "The Clumps," Lower Bourne, Farnham, Surrey. Telephone: Frensham 244.

The Illinois State Geological Survey, aided by the Office of Production Research and Development of the War Production Board, has initiated a research programme to study the problem of substituting mid-western coals for a portion of the eastern high-volatile coals now being carbonized in mid-western coke ovens. The programme includes the design, construction, and operation of a pilot-size coke oven to duplicate carbonizing conditions in commercial slot-type ovens, and a slot-type pilot-size coke oven of 500 lb. coal capacity has been developed. The yields and properties of the coke and by-products recovered from this small experimental oven correlate closely with those obtained by carbonizing the same coals in commercial ovens. Thus, this experimental oven is being used as a reliable guide for commercial operations.

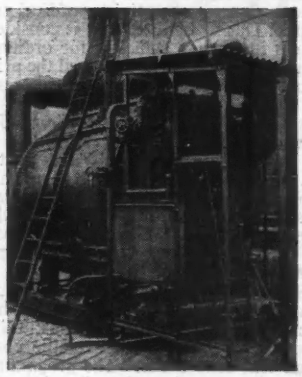
Mr. Alec E. Whitcher Deputy Chairman of the Haywards Heath District Gas Company and a Director of Associated Gas and Water Undertakings, Ltd., has just written and published *Soccer—the Ace of Games*, the profits on which are to be devoted to the Football Association's Benevolent Fund. As a Director of the Brighton and Hove Albion Football Club, Mr. Whitcher is able to add inside knowledge to a lifelong experience as an enthusiastic follower, and formerly an able amateur exponent of the game. In a foreword Mr. G. F. Allison describes the book as "extremely interesting and entertaining," and one which deals with many general topics in a way that will give food for thought and reflection." Photographs of the King, Field-Marshal Montgomery, and General Eisenhower at football matches are supported by a large number of original cartoons and sketches by Reg. Carter. Copies of the book may be ordered from any bookseller, from the publishers (Southern Publishing Co., Ltd., Brighton), or from the author at Alverstoke, Haywards Heath, price 10s. 6d., plus 1s. postage.



"Permac" Joints in a Gas Works.



"Permac" Joints in a Gas Works.



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Products Prices—Stocks and Shares

The London Market Jan. 8.

There are no changes to report in the prices of Coal Tar Products.

A Government Order came into effect on March 1 controlling the price of Benzole and Coal Spirit and replacing the Control of Coal Tar Naphtha and Xylole Order, 1943.

The Order is known as the Control of Benzole and Coal Spirit Order, 1944 (S.R. & O. 1944, No. 172).*

By this Order the price of Motor Benzole is fixed at 2s. per gallon. The Order also lays down the method of evaluating Crude Benzole.

The Order also calls for periodical returns to the Ministry of Fuel and Power from all producers of Crude and Refined Benzole.

In connexion with the Coal Tar products market, the Government Order designated the Contol of Toluene (No. 4) Order, 1944 (S. R. & O. 1944, No. 170), contains an amendment of the Control of Toluene (No. 3) Order, 1943.

Attention is called to a new Government Order, which amends the price of Toluene as from Sept. 1, 1944. The Order is entitled, The Control of Benzole and Coal Spirit (No. 2) Order, 1944 (S. R. & O., No. 988).

The only change in connexion with the prices of Coal Tar Products refers to Naphthalene. A new Government Order, entitled the Coal Tar Products Prices (No. 2) Order, 1944 (S. R. & O. 1944, No. 1051), allows increases in the maximum prices for all forms of Naphthalene. The new Order came into force on Sept. 22, 1944.

* Slightly amended by Control of Benzole and Coal Spirit (No. 2) Order, 1944, which amendments came into force on Oct. 1.

The Provinces Jan. 8.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's, 2s. to 2s. 2½d., pure, 2s. 9d. (now controlled by S. R. & O. 1944, No. 988, operative from Sept. 1, 1944. Benzole and Coal Spirit, also Coal Tar Naphtha and Xylole, are now controlled by the Control of Benzole and Coal Spirit Order, 1944, dated Feb. 18, 1944, S. R. & O. 1944, No. 172, operative from March 1, and S. R. & O. 1944, No. 988, part 1, operative from Oct. 1, 1944. Carbolic acid, 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil controlled by the Coal Tar Products Prices Order, 1943, dated Oct. 20, 1943 (S. R. & O. 1943. No. 1528), operative from Nov. 15, 1943, Naphthalene now controlled under S. R. & O. 1944, No. 1051, operative from Sept. 22, 1944.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Scotland Jan. 6.

Long term contracts are being renewed at current prices. Refined tar*: Yield to distillers is 4¼d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d.; hydrogenation oil,* 5⅞d.; low gravity or virgin oil,† 7¼d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 6½d. to 7d. per gallon. Solvent naphtha*: Basic prices delivered in bulk, 90/160 grade, 2s. 8d., and 90/190 Heavy naphtha, Unrectified, 1s. 10½d.; Rectified, 2s. 2d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

Stock markets opened the New Year with a cheerful tone and an increase in the volume of business. British Funds were in good demand, and several sharp upward movements occurred in the industrial market.

There were no special features in the Gas Section, where prices generally continued firm. A few fixed interest stocks showed small improvements, but a set-back occurred in Newcastle units, which closed 7½d. lower at the local exchange. The following are the price changes during the week:

PROVINCIAL EXCHANGES

Newcastle Units	25/6—26/–	–/7½d.
Ditto 4 p.c. Pref.	104—106	+1

OFFICIAL LIST.

Commercial Ord.	69—74	–1
Croydon 5 p.c. Deb. (x.d.)	122—127	Jan. 2
Gas Light 3 p.c. Deb.	87½—89½	+½
Imperial Continental Ord.	111—116	+1
Montevideo	89—92	+1
South Metropolitan 3 p.c. Deb. (x.d.)	83—87	Jan. 2
South Suburban 5 p.c. Pref.	110—115	+2
Ditto 4 p.c. Pref.	98—103	+1
Tottenham 4 p.c. Pref.	109—114	+2

SUPPLEMENTARY LIST

Croydon 4 p.c. Deb. (x.d.)	99—104	Jan. 2
North Middlesex 5 p.c. Pref.	108—113	+1
Tottenham 5 p.c. Reg. Red. Mortgs. (x.d.)	97—102	Jan. 2

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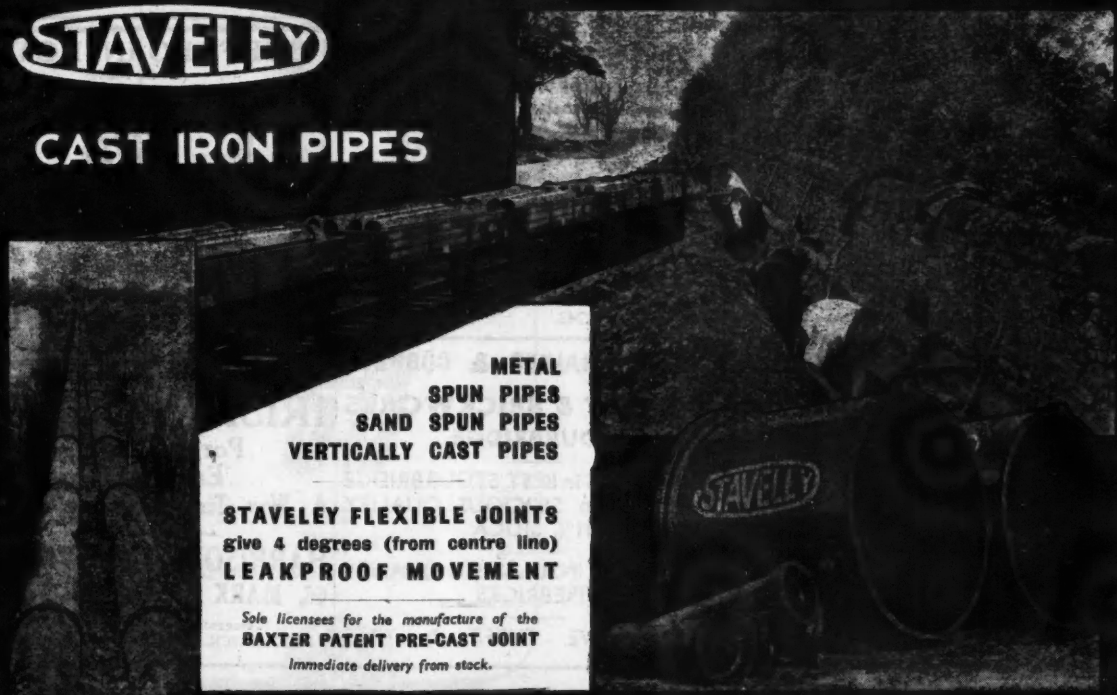

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give 4 degrees (from centre line)
LEAKPROOF MOVEMENT

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APPLICATIONS are invited for the post of ASSISTANT CHEMIST.

Candidates should state Age, Experience, and Qualifications, supported by recent Testimonials; also position under the National Service Acts. Salary according to ability.

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The plant must be capable of adequately dealing with 8 million cu.ft. of gas per day.

General conditions and particulars may be had on application to the Gas Engineer and General Manager, Gas-Works, Princess Street, Blackpool.

Tenders to be enclosed in an envelope endorsed "Electrical De-tarrer" and delivered to the Town Clerk, Town Hall, Blackpool, not later than 10 a.m. on Wednesday, January 17, 1945.

Town Hall, Blackpool.
December 28, 1944.

TREVOR T. JONES, Town Clerk.

COMPANY NOTICE

THE CROYDON GAS COMPANY

NOTICE IS HEREBY GIVEN that an ORDINARY GENERAL MEETING of the Company will be held at the Company's Chief Offices, Katharine Street, Croydon, on Friday, the 23rd day of February, 1945, at Twelve o'clock in the forenoon precisely, to declare dividends; to elect two Directors and an Auditor in the places of those who go out of office at the said meeting, but who, being eligible, will offer themselves for re-election; and for transacting the general business of the Company.

The Register of Transfers of Preference and Ordinary Stocks of the Company will be closed from the 10th February to the 23rd February, 1945, both days inclusive. Warrants for dividends, if declared, will be forwarded by post to the Proprietors, or their authorized agents, on the 28th February, 1945.

Dated this 29th day of December, 1944.

Chief Offices:
Katharine Street,
Croydon.

By Order of the Board,
FRANK FILLINGHAM WOOD,
Secretary.

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FOR SALE.—85 h.p and 30 h.p Bellis High-Speed Enclosed Steam Engine; 35 KW. Browett 220-volt Steam Generating Set; Calorifier by Royles, 5 ft. by 2 ft.; 5 in. 220-volt Electric Centrifugal Pump.

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WANTED.—Copy of Widlake's "Electricity on Gas Works" and A. T. Gilbert's "Gas Meters." Manager, East Hull Gas Company, Saint Mark Street, Hull.

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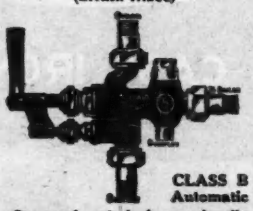

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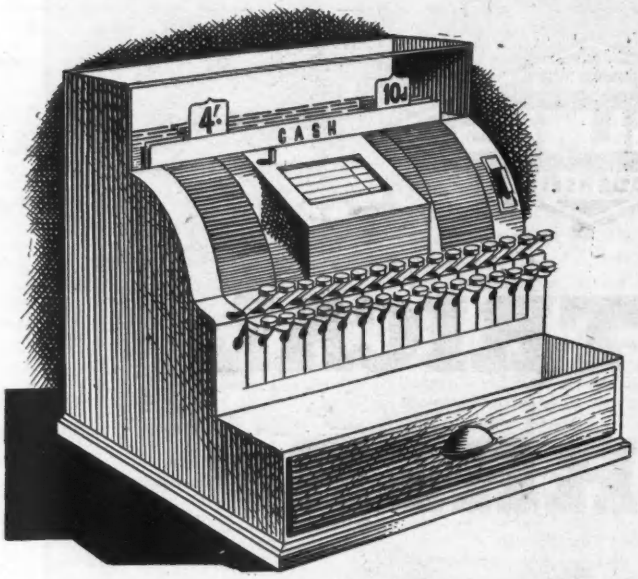

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780,000 cubic feet per hour
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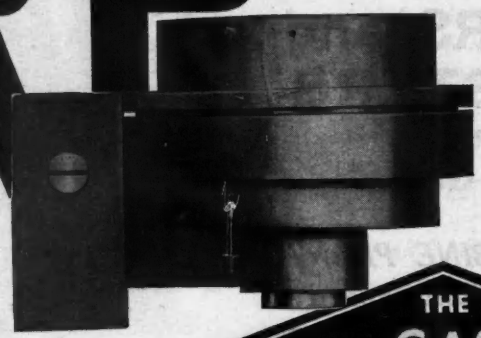

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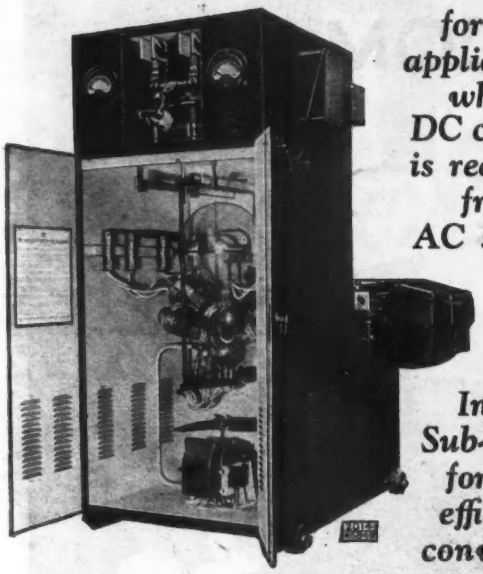

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- CHEAPLY
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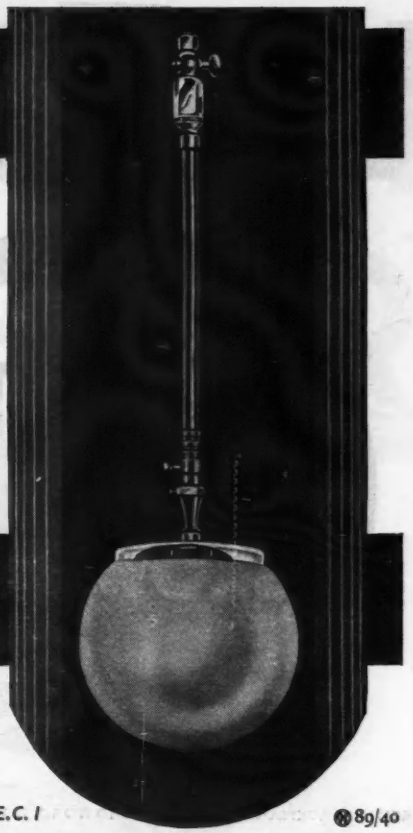

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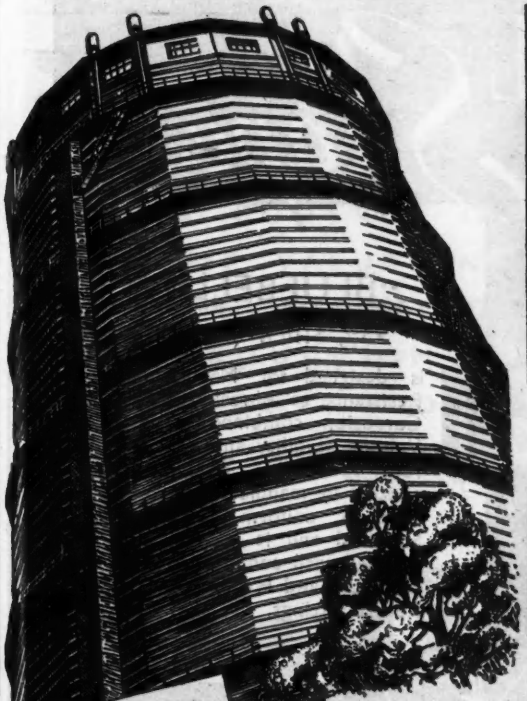

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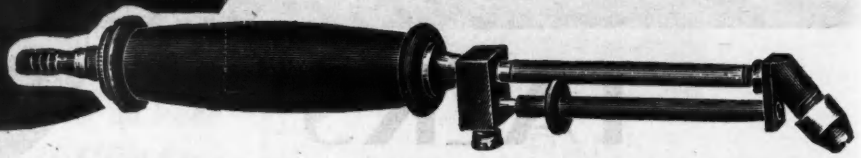

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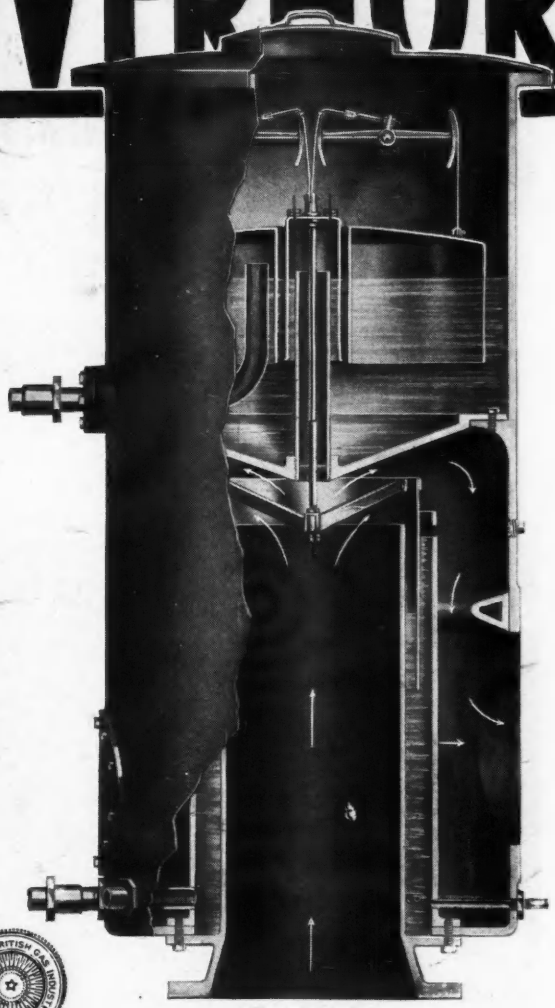

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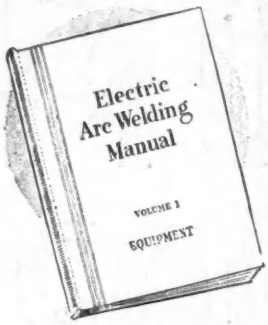

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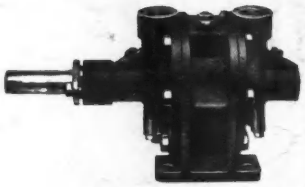

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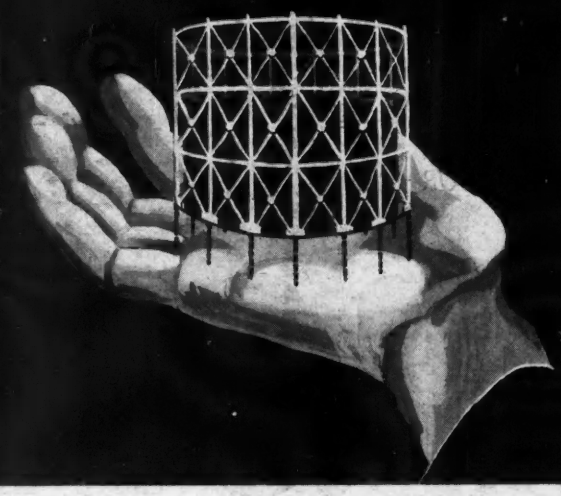

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